

**AN EXAMINATION OF THE IMPACT OF E-BUSINESS
EVOLUTION WITHIN SMALL AND MICRO
BUSINESSES**

A Thesis submitted for the degree of Doctor of Philosophy

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Abstract

This study focuses upon the distinctiveness of small business and utilizes an innovative action research methodology to enhance understanding of the nature and form of e-business evolution within micro and small firms. The investigation facilitates, through the creative Participatory Action Research approach, the actual process of e-business implementation. It uses this approach as a form of “research laboratory” to identify and analyse constraints to effective e-business uptake, and factors which enable utilisation of e-business and to assess the actual and potential advantages and benefits derived from successful e-business utilisation.

The use of Participatory Action Research sees the researcher ‘partnership working’ with the owner managers of five case study small businesses to identify and implement appropriate e-business tools. Integral to and within the context of the Participatory Action Research based approach this work uses an E-Business Development Platform which is unique to this study. This circumvents initial cost, ICT security and skills deficiencies which are commonly found to constrain small business uptake of ICT. Thereby providing a live action based ICT implementation context to facilitate an in depth investigation of key issues and factors associated with small firm e-business uptake and impact on working practices and strategic development. These are considered in the context of the firms’ relationships and relationship strategies as they migrate to more complex e-business provision.

The processes and outputs from each action research investigation are then considered, assessed and presented in case study form. The findings are discussed with regard to practical insight findings capable of informing small business management and development practice, e-business evolution and security, the firms’ relationship strategies and the relationship strategies that could be utilized by an ICT provider facilitating a small firm. The work concludes with consideration of its contribution to and enhancement of current academic insight.

Acknowledgements

The simple pleasure of being part a family gives me the greatest joy and so I would like to dedicate this work to my family, Christine, Ben and James.

Author's declaration

This is to certify that the work submitted in my thesis is my own work and has not been submitted for any other degree. Attention is drawn to the fact that some of the preliminary results were published as:

John McCarthy, Don Milne, *Application Service Providers and SMEs – The New Trusted Agents* The Institute for Small Business and Entrepreneurship 2005 annual conference (ISBE) Blackpool, UK November 2005

Don Milne, John McCarthy, *SMEs and a Level Playing Field* The International Conference on Information Warfare (ICIW) Washington, USA March 2006

John McCarthy, Dr Peter Wyer, and Don Milne, *The Utilisation of E-business to Facilitate Sustained Strategic Development in SMEs*. The International conference on Small Business (ICSB) Melbourne, Australia June 2006

Don Milne, John McCarthy, and Bryan Mills, *SME Security in the Digital Age*. The International Conference on Information Warfare (ICIW) California, USA March 2007

Some modifications for improvement have been made in the thesis based on the publications.

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Abbreviations

ASP	Application Service Provider
B2B	Business to Business
B2C	Business to Customer
CMS	Content Management System
CRM	Customer Relationship Management
DTI	Department of Trade and Industry
DVD	Digital Video Disk
EBDP	E-business Development Platform
EDI	Electronic Data Interchange
EEC	European Economic Community
FTP	File Transfer Protocol
ICT	Information Communication Technology
ISDN	Integrated Services Digital Network
ISP	Internet Service Provider
LAN	Local Area Network
NHTCU	National High Tech Crime Unit
PAR	Participatory Action Research
PCT	Personal Construct Theory
PHP	Hypertext Preprocessor
POP	Post Office Protocol
RSYNC	Recursive Synchronization
SIC	Standard Industrial Classification
SFTP	Secure File Transfer Protocol
SME	Small to Medium Enterprise
SMTP	Simple Mail Transport Protocol
SQL	Search and Query Language
SSH	Secure Shell Host
SSP	System Service Provider
TCO	Total Cost of Ownership
VAT	Value Added Tax
VLE	Virtual Learning Environment
WAN	Wide Area Network

1. Introduction to the Study

1.1. Introduction

Many organizations, irrespective of size and complexity, find change and development difficult to achieve and manage (DTI 2003, DTI 2004). This is particularly true of Information Communication Technology (ICT) projects where there are many examples that have over run both in terms of time and financial budgets. This creates reluctance within many small and medium sized enterprises (SMEs) to embark upon ICT development projects (Dixon et al. 2002, Matlay and Addis, 2003) and this is preventing many smaller businesses from achieving the cost, efficiency and development gains that properly implemented ICT solutions can achieve.

SMEs provide a significant contribution to the Gross National Product (GDP) of most market-based economies. In 2007 small and medium enterprises accounted for 51.5% of GDP in the UK.

The UK government sees the deployment and use of ICT as a major tool for businesses to be competitive both in the UK market and abroad (DTI 2004). Non adoption of ICT by SMEs may result in a negative impact on the UK economy due to the adoption and use of ICT in competing economies (DTI 2004).

To address these concerns this work examines the hurdles, challenges and opportunities facing SMEs embarking upon ICT development projects. Building upon current understanding and using an innovative research methodology this study will examine a range of factors that may determine positive and negative drivers in the adoption of ICT in SMEs. The results of this work will add to the body of knowledge which may assist SMEs to adopt ICT for internal and external business processing.

1.1.1. ICT Development History

The 1980s and 1990s saw a very rapid development of computer applications and technology. Prices of hardware and software fell dramatically whilst the processing

speed of computing increased. The use of desktop applications such as office packages became common place in the home and small business in the 1990s in developed countries.

During the 1990s the development of network based applications also grew rapidly. These services can be delivered from a local area network (LAN) or the Internet. This was coupled with the rapid deployment of a network infrastructure that enabled the majority of businesses in the UK to connect to the Internet. Importantly, Broadband became widely available. Due to its high network speed Broadband allows for a much wider range of applications and services to be run over the Internet. This allowed SMEs to use and deploy these Internet based services at an affordable price for the first time.

1.2. The broad research issues

The development of computing, the Internet and the network infrastructure combined to be known as “The Dawn of the Digital Age” (Tapscott, 1996). The dawn of the digital age led to the birth of the Digital Economy. The digital economy is not just the computing and related telecommunications industries but the way in which businesses and business processes are being performed and transacted in the new medium of the Internet (Tapscott, 1996).

In the new digital age many large institutions have changed the way they operate. The UK government has adopted new working practices to take advantage of widespread Broadband connectivity. These changes and developments will have an impact upon the working practices and the environment small firms strive to operate in.

It is said in the media and in other sources that the new digital economy holds many opportunities and potential benefits for SMEs.

To take advantage of the opportunities that the digital age presents organizations may have to change the way that they operate. It is known that the lack of in house knowledge of ICT in SMEs is resulting in them viewing internal and external business processing as too complex or difficult to manage (DTI, 2004).

As early as the second half of the 1990s, the relatively slow adoption of e-commerce by SMEs in the UK raised concerns amongst business observers and policy makers alike (Matlay and Addis, 2003). This research tackles some difficult and challenging problems that face governments, policy makers, academics and the ICT industry.

1.3. The objectives of the investigation

The overall aim of this study is to:

Examine e-business evolution within small and micro firms and its impact on strategic development and working practices.

The sub-objectives of the study are:

- To consider the extent to which, and how, providing a small firm with ICT provision capable of e-business functionality impacts on the strategic development context of the participant firms.
- To consider the extent to which, and how, providing a small firm with ICT provision capable of e-business functionality impacts on the working practices of the participant firms.
- To determine the ICT security implications of empowering a small and micro firm whilst undergoing ICT development.
- To examine the extent to which, and how, providing a small firm with ICT provision capable of e-business functionality impacts on the relationship strategies of the participant firms.

In addressing these aims and objectives, this work seeks to enhance understanding of how ICT can be utilized within an SME to facilitate improved working practices and business development such as consolidation of current market position, market penetration and development, new product development or diversification into new areas of business activity. A key area of focus will be the strategies, strategy development processes and strategic development path of the participant small firms. This work will demonstrate that a key influence in SMEs is the firm's owner

manager. Thus, issues such as how owner managers identify and act upon opportunities when developing or deploying ICT will be key. Enhanced understanding of such issues can assist in a more effective ICT use in SMEs in the future.

1.4. Definitions and terminology

This section provides clarification of key definitions and terminology used within the study:

1.4.1. Small-Medium Size Enterprises (SMEs)

The Bolton Committee in its (Bolton, 1971) report on small firms stated that an SME is

.....An independent business, managed by its owner or part owners and having a small market share.

For the purpose of this study the definition of an SME will be based on employee levels as captured in the EU classification:

- Micro those with 0 to 9 employees (zero employees are sole traders)
- Small with 10 to 49 employees
- Medium with 50 to 249 employees

(http://ec.europa.eu/enterprise/enterprise_policy/sme_definition/index_en.htm)

1.4.2. Broadband

Broadband is always a relative term, understood according to its context. It generally refers to connections to the Internet with much greater bandwidth than one can achieve with an analogue modem. There is no specific definition of the speed of a Broadband connection but in general any Internet connection using DSL or via Cable may be considered a Broadband connection. Thus, the term Broadband is technically difficult to define. At the outset of this work Broadband was considered to be a

1 megabyte per second connection. In 2008 20 megabytes per second connections are freely available which are classified as Broadband or high speed Internet access.

1.4.3. Strategic development context

In this work the term strategic development context (as incorporated in sub-objective one) is used to capture research focus on small business interaction activity with its external operating environment, owner manager strategic control and management activities and integral ability to identify, learn about and act upon strategic development opportunities.

The strategic development process is defined as any activity that occurs within a firm that may support and facilitate the delivery of the firm's strategic objectives and/or unfolding of new strategic development paths or objectives.

1.5. Scope and limitations of the study

In Chapter 2 this work will demonstrate that an SME is different in many respects to a large organization. It will also highlight the differences between SMEs within the classification used. A micro firm with 5 employees will be very different to a medium SME with 240 employees. To gain the depth of insight needed this work will focus on micro and small firms. This is the area where research to date has shown that ICT adoption has been the most difficult to achieve (DTI 2004, Dixon et al. 2002).

1.6. Overview of the study

There is a general view in the media and in other sources which adopt a deterministic perspective of ICT. This has been predicated on the assumption that ICT must be a 'good thing' for SMEs. It has also been difficult for researchers to isolate trends in ICT from more general economic and organizational change drivers. Factors are likely to include levels of internationalisation, types of exporting activities, awareness of benefits, types of customer and the enforced use of ICT systems by larger trading partners. This has exacerbated the patchy nature of early (pre 2000) research which is discussed in Chapter 2.

Previous research often disregards the interaction between the use of ICT when owner managers of small firms build relationships and its obvious use as technology. This work will demonstrate that firms rely heavily on relationships and that if these relationships are not considered then this can be a hurdle to ICT adoption. Therefore it will examine sociological as well as technical theories. This multi disciplinary approach has been adopted by other academics. The joint perspective of social and technical theories has been considered in a number of works (Law (1991); Grint and Woolgar (1997) and in particular Fuller and Lewis (2003), who have examined ICT use in building and managing relationships within the small firm.

To achieve the aims and objectives of this study a qualitative research methodology building out of the epistemological bootstrapping work of Archer (1988) and Wyr (1990) is utilized. Their work shows that depth of insight can be derived from the application of a multidisciplinary case study research approach. This is based on contextual analysis that facilitates investigation of the inter-relatedness of the firm's development processes and context. Previous qualitative research built on case studies has found that managerial support and a sense of strategic direction have been fundamental in ensuring ICT success in SMEs (Dixon et al. 2002). In this work the insight gained from the literature is intertwined with the research methodology to provide an initial platform for the case study investigations. This is coupled with the inductive logic of the researcher and research team. To achieve this Wyr's methodology has been adapted for this work. It incorporates the use of Participatory Action Research (PAR). In PAR the researcher becomes an active participant within the study. The PAR process is facilitated through the deployment of an E-Business Development Platform. How this is achieved is discussed in Chapter 3.

Thus, this work will use a multi disciplinary approach to determine factors that may hinder or enhance ICT adoption in micro and small firms. Integral to this it will examine the strategic development processes of the firms studied. It will also examine the role and relationship of an ICT provider with the participant case studies. This may aid the implementation and adoption of e-business for internal and external business processing to improve profitability and revenue generation.

1.7. Organization of the thesis

This concluding section summarises the thesis by chapter, offering summary insight as to content and process of each chapter and portraying the overall structure of the thesis:

Chapter one, this chapter, provides introduction to the research in terms of research issue context, research aim and objectives, scope and limitations of the study. It also provides clarification of key terminology and definitions used throughout the work. (Together with this explanation of structure and integral step process of the thesis).

Chapter two presents the literature review which is approached in the form of an epistemological bootstrapping process. The aim of which is to identify relevant areas of existing literature, field-based knowledge and understanding and in turn integrate those areas of insight into a conceptual framework. This can inform and underpin the approach to a subsequent empirical ‘participatory action research case study’ element of this research. The chapter concludes with elaboration of the conceptual framework.

Chapter three develops and justifies the research methodology utilized within the study. The conceptual framework developed in Chapter two is used to inform the methodology design process, including firming up the overall research aim and sub-objectives and identification and development of an appropriate and innovative qualitative, Participatory Action Research (PAR) based research approach. Participatory Action Research and its specific component parts are elaborated and underpinning compatible philosophical standpoints of the research are put in place. A unique Personal Construct Theory based dimension of the method is developed. The chapter concludes by addressing issues of quality of research process and findings, ethical dimensions of the research and any potential underlying limitations of the study.

Chapter four commences the empirical component of the research by presenting the first two case studies, the first a manufacturing business and the other from the business services sector. A critical part of the research process and communication of that process and its outputs is the presentation of each case study in descriptive analysis form and the use of a common descriptive analysis reporting structure. Such

an approach captures case study context, processes and outputs as a key contributor to enhanced knowledge and understanding of small business development.

Chapters five, six and seven continue presentation of the case study components of the research. Chapter five studies a small business in the retail health care sector, focusing on and examining the firm's progress through several important stages of e-business development.

Chapter six examines a micro business based in Germany. In particular, the case study highlights how the strategic development of firms can be influenced by the relationships they have with other businesses and potential stakeholders when creating hubs and networks.

Chapter seven presents a case study focus on the relationship strategies of the owner manager of a micro firm utilising ICT. The case study also extends insight into ICT and business development issues surrounding the creation of hubs and networks in micro firms.

Chapter eight considers the key findings of the case study investigation within the context of the specific dimensions and issues embedded within the objectives of this research study in its totality. Discussion focuses on the findings and results of the case study investigations before highlighting key areas of generic insight which represent learning points capable of informing small business development. The chapter then concludes with discussion by highlighting key areas of the research findings which support or extend understanding as embedded in the literature.

Chapter nine, the final chapter, summarises key findings of the study and the innovative research methodology that produced those findings. It then considers the potential for further research that could build out of this work and offers suggestions how future research approaches may be enhanced. The chapter concludes by considering the practical implications of this work for small business ICT providers.

2. Literature Review

2.1. Introduction

This literature review is approached in the form of an epistemological bootstrapping process (Archer 1988, Wyer 1990; 2001). The intention of which is to identify relevant areas of existing literature and field based knowledge and understanding and in turn integrate those areas of insight into a conceptual framework. This framework in its totality and from perspectives embedded in its component parts, can inform and underpin approach to a subsequent empirical participatory action research case study element of this research.

The review will focus on:

- a) Areas of small business development and management knowledge to make explicit the distinctiveness of small business vis-à-vis large well-resourced companies and tease out relevant understanding of the implications of this distinctiveness for this study.
- b) Current understanding of e-business and key issues relating to its uptake, implementation and utilisation in a small business development context.
- c) The specific need to focus upon the pivotal role of the owner manager with regard to effecting ICT uptake in the small business and the potential for utilising Personal Construct Theory as a research vehicle for facilitating in depth analysis of the owner manager lead role.
- d) Key insight embedded within the strategic management literature capable of informing approach to consideration of the use and evolution of e-business in the small business strategic development context.

As an integral part of an epistemological bootstrapping process the literature review is effectively extended into a field review. This is achieved through the use of the author's world of practice experience in constructively critiquing the literature under review and in the use of other world of practice insight in that critiquing process (for example, in the obtaining of expert point of view from small business owner

managers and small business support and ICT expert providers during critique of the literature under consideration).

The epistemological bootstrapping process requires concluding of the review through the development of a conceptual framework which in diagrammatic form portrays and integrates the ‘bootstraps’ or ‘partial frames’ of relevant management and ICT knowledge revealed in the literature review. This in their component parts and total conceptual framework is capable of informing the case study element of this research study. Thus, the resultant conceptual framework is composed of informing insight with regard to what is ‘known already’ which is relevant to this study (in terms of understanding in descriptive, concept and/or theory form) and what knowledge gaps exist which need to be considered or addressed in the approach to the empirical component of this work. The epistemological process generated conceptual framework also makes explicit key assumptions upon which progression of the empirical component of the research will be based.

2.2. The Distinctiveness of the Small Firm

The review begins by challenging the notion that a small firm is simply a “cut down” version of a large organization. Academic and wider sources of literature often treat all organizations as the same, regardless of size. These uniform perspectives of understanding organizations, may fail to highlight the unique elements of the small firm. Thus the potential significant differences between small and large firms may be overlooked and as a result a lack of insight may occur. This work examines e-business and it can of course be argued that all forms of business occur in the same manner on line or off line. Goods and services are sold or data exchanged and if one examines these processes they are fundamentally the same irrespective of the firm’s size. This work will show that it is how small firms operate that differentiate the small firm from the large organization and demonstrate the impact this has on e-business development. This is not just based in the obvious advantages that a large firm has in its infrastructure and resource capabilities but in how a small firm operates within its environment. This includes the firm’s relationships inside and outside the firm. This work will also show that one element of uniqueness is the locus of control that the owner manager exerts.

In 1971 the Bolton (1971) report first defined SMEs and the broad definition it uses based on employee size and turnover often causes problems for researchers. Even within the boundaries of the definitions of medium, small and micro firms there are obvious and significant differences. Arbore and Ordanini (2006) state:

Considering SMEs as a monolithic reality, however, might be misleading. This group of firms can be extremely heterogeneous and its average values may hide important internal variances.

An SME with 240 employees will be far more like a large organization than a micro SME with 5 employees. Therefore when researching e-business evolution in small firms there is a need to define and focus the study. This work examines small and micro firms wishing to engage and deploy e-business. Cohen and Levinthal (1990) suggest that the ICT absorptive capacity of a small firm, namely its capability to exploit ICT potentials differ according to the size of the firm. Welsh and White, (1984) suggest that small businesses should not be treated as if they are 'little big' businesses. They suggest significant qualitative differences as well as quantitative differences between small and large firms. These differences may be positive or negative. Small firms may have distinct enabling or constraining features which impact on the development of the firm. Curran (1988) suggests many small firms face internal restraints. The retention and training of staff can be difficult thus hindering development. This may be coupled with the inability to offer salary levels and perks which a large company can provide. Poor quality career development for staff can also result in small firms attracting less able, less experienced or less committed workers. This can result in problems such as absenteeism, lateness, or leaving without notice. Large companies are more able to cope with these circumstances due to the large resource base they can draw upon.

Many authors agree that small firms also face external restraints. Fillis and Wagner (2005) highlight severe resource constraints as a principle difference between small firms and large organizations. Hall (1989) agrees and suggests that a lack of required levels of security or collateral, or of profit track record, can restrict a small firm's attempt to raise finance and thus hinder development. This may not always be the case, but many reports and studies have shown this premise on the whole to be valid

(Dixon, et al. 2002, DTI 2003, 2004). Carson (1991) suggests that small firms suffer from difficulties in attempting to enter established markets and in obtaining adequate market information. The low levels of resources that can be found in a small firm also hinder advertising and marketing.

2.3. Small Firm Uncertainty, Innovation, and Evolution

Many of the characteristics of a small firm have both positive and negative aspects. How these are managed within the small firm determine if these are beneficial to the firm or cause problems. Storey (1997) identified three areas where small firms differ from large firms. These being, uncertainty, innovation and evolution. If these are managed effectively then a small firm can be better placed to react or build upon events and situations as they unfold. The opposite is also true.

When examining uncertainty it can be argued that small firms are much less able to manage or cope with change in their external environment than larger firms. Large firms with a greater resource base are better placed to cope with macro level events such as economic downturns, political events or terrorist events such as 9/11. Recent events in the UK such as the outbreak of foot and mouth disease in cattle had a severe impact on many small firms operating in the farming industry.

Thus a smaller resource base and often a more limited knowledge about its environment place the small firm in a more challenging situation than larger firms. However some academics such as Tapscott (1996) feel that the opposite is true. The small firm's size gives it a flexibility to adapt to change as events unfold that larger firms cannot manage so quickly or easily. Other academics question if this is true for many small firms. Wyer (1997) acknowledges this potential in small firms but this potential is based on the ability of the owner manager of the firm to seize and develop opportunities or manage threats effectively.

The motivation of many owner managers for being in business may make them vulnerable to uncertain change situations. Bolton (1971) suggests that an understanding of the owner manager is an important consideration when examining the behaviour and motivations of a small firm. Storey (1997) proffers that many owner managers only wish to earn a living and do not focus as much on increasing

products and sales as a large organization would. Boone (2000) also suggests that the lifestyle choices of the owner manager have a direct bearing on the choices made for the firm. These issues and lifestyle choices demonstrate that many small firms operate differently to large firms who will always seek to increase their position in the market place. The notion of managing and owning a lifestyle business simply does not exist in large corporations. These choices combined with a lack of resources discussed earlier can combine to create uncertainty in the firm's operations. Thus the flexibility to manage uncertain change situations may be hampered by the lifestyle choices of the owner manager.

Small firms can be innovative and evolve rapidly. For Storey (1997) innovation can be defined in several ways. Firstly small firms can grow at a very fast rate. They can have a flexibility to develop and offer products and services that large organizations can be much slower at creating and delivering. In the realm of e-business Tse and Soufani (2003) agree with this potential. Freel (2000) suggests that some small firms exhibit superior innovative and competitive capabilities when compared to large firms, due to their flexibility. Wyer (2003) confirms this perspective but emphasises this should not be viewed as absolute:

Certainly, because of features unique to small businesses, many have the potential to be flexible fast responders. For example, small businesses are often void of red-tape and bureaucracy because of a lack of formal hierarchical structure. This can result in short decision-making lines and facilitate ease of communication. Moreover, closeness to customer can mean that the small business can quickly gain understanding of changing tastes and derive depth of insight into the needs of its customer base. Such understanding can then form the basis for internal adjustments in the light of the identified change.

Unfortunately, however, such benefits and strengths are not absolute across all small businesses. They are better viewed as potential benefits. Many small businesses face unique problems, problems which are not faced by large companies and which stem mainly out of the qualitative features which distinguish the small business from the large company.

Some small firms are innovative and Storey suggests that many small firms survive by evolving and offering value added services to products that differ to those of mainstream offerings of the large organization. This type of value added service is recommended by Tse and Soufani (2003) and Tapscott (1996). The creation of new value added services is often accompanied by changes in working practices within an organization. Storey (1997) suggests that small firms have a greater degree of flexibility to achieve this. They can react quickly and evolve working practices to suit a new situation as it arises. In this sense Storey (1997) feels that small firms are more capable than large organizations at evolving to adapt to the needs of a constantly changing external operating environment. However the influences of other small firms, the extended enterprise and relationships with large organizations also need to be considered (Tse and Soufani (2003), Fuller (2003), Wyer (2003))

The characteristics of a small firm are varied. This is one of the most challenging aspects of this work. Small firms span a wide range of industry sectors and this may highlight differences, as well as the influences of the owner manager and wider external factors that exist outside the small firms. These differences will be emphasised in this study as it examines firms at the micro and small level where the differences between large organizations and small firms is more extreme.

This study will therefore envelop the contextual framework of a small firm which includes the influences of the owner manager. This framework consists of the relationships, environment and the pivotal role and influence of the owner manager. Fuller (2000) and Wyer (2004) agree that the contextual framework is vital for understanding how a small firm makes decisions and acts. Fuller and Moran (2000) believe that considering a company in isolation from its context and environment provides a restrictive picture since it leaves out the influences which businesses have on one another and their level of interconnectedness. This level of interconnectedness endorses the case study qualitative approach used in this work as it encompasses factors that may not be apparent at the outset of the study. The notion of interconnectedness leads onto the concept of the co-evolution (Holland 1995, Kauffman 1995, Johannison et al. 1994 and McKelvey 1999) of small firms will be considered later in this work and examined in terms of ICT adoption.

Thus the issues facing a small firm may require an innovative research approach to fully understand the problems they face and the environment they exist in. Therefore the use of large firm oriented management techniques may not always be suited to the unique problems faced by the small firm (Gibb 1983). Gibb also suggests that the theoretical management approaches based on rational long term planning models are inappropriate for small business management. This is compounded by a lack of time, resources and ability constraints which result in many small businesses having severe difficulties relating to their external operating environment. Therefore when researching the small firm both the internal and external issues that are unique to the small firm environment need to be encompassed and understood by the researcher. The influences of the owner manager are also crucial and need to be integral to the research process. It is the combination of these elements that help define the uniqueness of the small firm which requires an innovative methodology to study a small firm when adopting e-business.

2.4. E-business and the Small Firm

This section of the review begins by examining a range of e-business definitions and models that measure e-business development. It then goes on to detail small firm e-business research and highlight pertinent results of major studies undertaken in this area. This informs the study and provides a rationale for examining hurdles to adoption for a small firm wishing to engage in e-business. It then discusses how wider environmental influences may also play a role in e-business adoption. Finally it proposes that ICT relationship strategies and the context that ICT is used in have an impact on ICT development with the small firm.

In order to measure e-business we must first define it. There is a lack of clarity in the literature between the terms e-business and e-commerce (Fillis and Wagner, 2005). Putterill (2003) and Ramsey et al. (2003) note that the terms Internet, the World Wide Web and E-commerce tends to be used interchangeably. Zwass (1994) uses the term Internet commerce as the sharing of business information, maintaining business relationships and conducting business transactions by means of Internet-based technology. Kalakota and Whinston (1997) see e-commerce as the buying and selling of information, products and services via computer networks that are mostly via the

Internet. Quayle (2002) uses the term e-commerce to embrace a number of formats including electronic data interchange (EDI). Ihlstrom and Nilsson (2003) use e-business to describe how corporations utilize information technology to conduct business and achieve competitive advantage. For the purpose of this work the definition of e-business is:

A fundamental way in which business will be done – aided, abetted, supported, and enabled by technology. E-business is not just the World Wide Web. E-business involves e-business technologies to enhance profitability by:
Transforming business processes to compete in new, faster, better ways (Stone 2004)

This definition encompasses all of the previous notions of e-business and e-commerce. It allows for a wide range of technologies to be encompassed such as SMS messaging and allows for the inclusion of new technologies. This definition by Stone is the one used by IBM. This coupled with the Internet States that Stone (2004) defines in an e-business model described later in this work give a clear understanding of e-business processes and paths to e-business evolution.

However this work will demonstrate that there is a blur in the small firm between social and business functions in many areas. Examples are in the areas of relationships and relationship strategies, clusters and hubs, and personal contact networks. The blurring of these boundaries means that to consider e-business in small firms as a purely business orientated function without consideration of the social aspects of ICT implementation may cause problems in small firm e-business adoption. There are many works that will highlight this issue within this review. Most notable of these is the notion of the owner manager's influence on the small firm.

2.4.1. SME E-business Development

Much of the research undertaken in e-commerce has tended to focus on the large firm (Fillis and Wagner 2005, Drew 2002). The DTI Benchmarking (2003) study in this area reveals a clear divide between the use of ICT in medium and large firms and ICT for micro and small firms. There is a digital divide amongst the SME groups.

Smaller and micro firms are struggling with ICT. Levy and Powell (1998) found that small firms are less likely to possess changing attitudes in ICT. They do not possess the more sophisticated levels of ICT seen at corporate level. Arbore and Ordanini (2006) and Daniel and Grimshaw (2002) suggest the digital divide between large organizations and small firms is a fairly well-known phenomenon, which points out the asymmetry in information and communication technologies (ICT) endowment and use. Small firms are adopting Internet connections but are not utilising the technologies that it can foster. Another factor for the digital divide is the lack of environmental resources. This not only refers to the availability of physical infrastructure, but also that of service providers and partners with expertise (Corrocher and Ordanini (2002)).

The DTI benchmarking (2004) study suggests that small firms are much less formalised or structured in their thinking about ICT, and they have a more opportunistic approach to ICT investment. A similar report by the Small Business Service Research Programme (2002), agrees with these findings. On the whole small firms have been slower to adopt e-business and research into this area has also been slow to develop (Fillis and Wagner, 2005). Some e-business research has been undertaken which includes benchmarking Internet use (Webb and Sayer, 1998), innovation and learning (Chaston, 2001), the micro enterprise and Internet usage (Dandridge, 2000), entrepreneurship and the Internet (Colombo, 2001) and barriers to adoption (Walczuch et al., 2000). These works confirm the digital divide.

When examining e-business adoption an important issue in understanding the needs of small firms is that they are not a homogeneous group (Fillis and Wagner, 2005). Their needs will vary by sector. Naturally, high-technology small firms are more likely to use e-commerce than others. There are also differences between industry sectors in terms of e-commerce use and strategy development. The Small Business Research Team (SBS, 2006) provides data on ICT investment and e-business. The report shows that the business service sector invests more than the manufacturing sector and the retail sector invests the least of the three sectors they studied. These differences add to the problematic nature of e-business research in small firms.

2.4.2. E- business Development Models

When analysing e-business uptake (to use ICT in business processes) in small firms several models were examined and compared (Curd's (2000) and Stone's (2004)). Each of these models examines a hierarchy of levels of e-business deployment. They all differentiate between distinct e-business activities. Curd's model is shown in Table 1.

Exchanging	Swapping information between and amongst customers, partners or suppliers.
Publicising	Advertising and marketing goods and/or services by electronic means.
Interacting	Customers can view and order online, but payment for goods and/or services is made by traditional means
Transacting	As in "interacting", but payment takes place online.
Integrating	Sales and purchases are fully integrated in one, online operation

Table 1 E-business activities Curds (2000)

These services or ICT based processes can be based within an organization or hosted on servers on the Internet. In order to measure e-business development it needs to be defined. Curds (2000) used a hierarchy of levels of e-commerce employment for analysing the uptake of e-commerce in small firms. Stone (2004) also developed a similar model using six States, sometimes called levels. Each state assumes the existence of all of the previous ones:

1. Access	Some people or everyone (in the organization) has access to the Internet, usually just for e-mail. A very simple Web site may be maintained.
2. Publish	"Static" multi-page Web site for information purposes only
3. Transact.	Web site supports one or two-way transactions with the end user, but does not support fully integrated processing of transactions.
4. Integrate internally	Use of e-business to transform internal organization and processes, radically reducing costs and optimizing the business
5. Integrate externally	Use of e-business to create a seamless, transparent process across the entire value chain, from customer through intermediary through all supplier tiers.
6. Adapt dynamically	Use of Internet technologies as the foundation for operating in a digital, virtual community. For example, fully e-integrated institutions can seamlessly in-source or out-source processing functions as demanded by market conditions and changing company structures.

Table 2 Internet States (Stone 2004)

In the early stages Curds and Stones levels are similar. Stone's examines integration in more depth by distinguishing between the internal and external parts of an organization. Stone's State 6 (adapt dynamically) extends beyond Curd's work by giving a clearer definition of what is required in the advanced stages of ICT to those wishing to enter the digital economy. Stone's model will be used in this work due to its encompassing the internal and external needs of the firm more fully.

2.4.3. Small Firm Internet Connectivity

To undertake most e-business functions a network connection is almost always required to process information within an organization and an Internet connection is required for external processing. One of the easiest and broadest ways to measure e-business uptake in small firms is to measure Internet connectivity. Without an Internet connection the functions of Stone's Internet States cannot be achieved. This measurement only allows for knowledge of connectivity in small firms. It does not give any information on what processes are undertaken. However Abell and Lim, (1996) and Fuller and Jenkins (1995) suggest the Internet differs from other forms of ICT in terms of its ability to transform the way in which business is carried out.

Internet connectivity allows for business processing to occur outside of the organization. Therefore Internet connection rates are important in measuring e-business adoption. Mehrtens et al., (2001) and Prieger, (2003) recognize the adoption of broadband technology as important, since a Broadband connection to the Internet is a main precondition to achieve the benefits of e-business.

	Micro		Small		Medium		Large	
	2003	2001	2003	2001	2003	2001	2003	2001
Connected to the Internet	45%	62%	69%	77%	90%	89%	98%	94%
Use Internet	55%	76%	84%	91%	97%	96%	99%	97%
Trade online	17%	18%	22%	19%	29%	23%	38%	27%

Table 3 SME Internet Connectivity DTI benchmarking study 2001-2003

Table 3 shows the Internet connection Figures for 2001 and 2003. Connections for micro firms fell. However there could be misleading information in these statistics. Business connections are more expensive than domestic ones and micros may well be switching to these. Small SMEs are also "clicking off" and not using the Internet but there is a rise in online trading. This would suggest that some of those who have this technology are utilising it more effectively. However the overall connectivity in these groups is still falling. Medium SMEs and large companies still have growth across all three areas.

More recent data released by the European Union in 2007 suggest that almost all enterprises in the UK have Internet access (92%) and 70% of all enterprises have a website. Broadband connectivity has been increasingly replacing dial up connections. The speed of Broadband has also been increasing with connections of less than 2MB reduced to 42.0 % of market share. The most common rates of Broadband in 2009 are between 2 and 8 Megabytes.

It may be the case that as Broadband connections are now freely available across most of the UK those firms that want Internet connectivity already possess it. During

the past decade we have seen a roll out of Broadband in the UK and connectivity is now virtually ubiquitous.

2.4.4. E-commerce Adoption

Measurements of ICT and e-commerce adoption in small firms tend to focus on access connectivity rather than on strategic and/or marketing advantage (Martin and Matlay, 2003). Feher and Towell (1997) suggest that during the late 1990s most small firms experienced difficulties in overcoming performance gaps and exploiting the new opportunities created by ICT and the Internet. It appears that owner managers lacked the necessary ICT skills and competencies, as well as the experience of on-line trading. Thelwall (2000) suggests this resulted in a large proportion of small firms adopting an e-business strategy that relied on poor quality websites and missed market opportunities for growth and development. Martin and Matlay (2001) suggest there is a lack of empirically rigorous research to document the initial period (1995–1999) of ICT adoption and Internet based trading by small firms. The literature tends to concentrate on post 2000 aspects of small firm based e-business (Martin and Matlay, 2003).

The Department of Trade and Industry (DTI) published the report ‘Business in the Information Age: The International Benchmarking Study’ (2004). The report is based on business and ICT professionals in nearly 8000 businesses – 2716 in the UK and 500 in each of 10 other countries that participated. The UK government sees ICT adoption as an important part of keeping the UK as a leading economic force. A large number of firms, over three-quarters, identify resources (ICT trained staff, cost of hardware and software) as the biggest consideration that prevents them from deploying ICT solutions. The recent report by the Office of National Statistics (2007) confirms this with firms of all sizes finding ICT trained staff difficult to recruit.

Despite the lack of a formal ICT strategy in 50% of firms, more than two-thirds of companies in the report stated that they do not see the practical difficulty of mapping new systems into existing processes as a deterrent to investing in ICT. This is despite the fact that difficulties in ICT implementations are a near certainty without a development plan (Dixon 2002, Tse and Soufani 2003) which many small firms do not implement. The report agrees with other findings by Hughes, et al. (2003) and

highlighted that successful e-enabled small firms were customer focussed, made extensive use of planning at strategic and implementation levels and had a clear emphasis on integrating ICT into the main business activities.

More recent reports on e-business adoption show an increase of e-business use. The 2007 e-commerce Survey of Business published by the Office for National Statistics stated:

The results of the 2007 e-commerce survey, which was based on businesses with 10 or more employees, show large increases in the value of trade over the Internet and some levelling off in growth in the use of some Information and Communication Technologies (ICTs), such as computers, Internet access and websites. Saturation is being reached by most business groups in these ICTs.

Key findings of the survey include:

- Internet sales represented 7.7 per cent of the total value of all sales.
- 60.8 per cent of businesses used the Internet to interact with public authorities, such as government departments and local and regional authorities in 2007, an increase of nearly 18 per cent since 2006.
- 70.3 per cent of businesses had a website.

There are significant differences in the rate of adoption of newer ICTs between the largest and smallest businesses. Supply chain management systems were used by 33.4 per cent of businesses with 1000 or more employees in 2007, compared with only 4.2 per cent of businesses with 10 to 49 employees.

Whilst the largest businesses have led the way with the adoption of ICT, the smallest businesses have closed the gap with the use of more established ICT such as Internet access and websites.

Some academics suggest that e-business adoption does not involve a staged process. Daniel et al. (2002) suggest that e-business growth, like small firm growth generally, tends to be non linear and does not conform to a step-by-step approach. Some small firms are now behaving in an 'instant international' or 'born global' sense, where the stage-by-stage progression is now redundant (Knight and Cavusgil, 1996; McAuley, 1999). The key phrase is "born global". This implies a newly formed small firm. In

such cases a staged approach is not required as the new company can enter international markets through the adoption of Stones Internet State 3 (transact). However in many established small firms the transition to more advanced forms of e-business is one that needs to consider issues of legacy ICT systems.

Fillis and Wagner (2006) suggest that there are a number of owner manager orientation implications that relate directly to e-business development. Being able to successfully combine the hard technical skills alongside the often softer entrepreneurial marketing competencies was identified as a key factor in small firm e-business development. They also found a range of attitudes in the small firms they studied to e-business adoption. They range from a “wait and see” approach to a strategic integration of e-business as part of ongoing business development. The first principle fork they identify in the adoption chain is that of positive and negative attitudes to e-business. This in many small firms is the attitudes of the owner manager. For Fillis and Wagner (2006):

A range of attitudes have been identified that relate to the orientation of the owner manager of the firm. Entrepreneurial thinking is more likely to be linked to positive attitudes towards e-business compared to conservative, risk-averse behaviour. These latter types will be less likely to take the lead in e-business development and will either be followers or non-adopters. Linked to entrepreneurial/conservative orientation is the ability to overcome both physical and perceptual barriers to e-business. Entrepreneurially oriented small firms perceive barriers in a positive fashion whereas the conservative firm may exhibit highly negative attitudes.

Small firms may adopt e-business for several reasons. They may adopt ICT to gain increased revenue and stay ahead in the market place. There may however be other factors involved, which mean the reason to change or not is dependent on factors outside of pure profit and revenue. Some studies show that pure profit generation is not the main motivating factor in some small firms (Fuller, 2000). Fuller states that other factors such as increased service to customers or remote management of the business may play a part. The owner may simply just have an interest in this area. Ramsey, et al. (2003) suggests that e-business decision making in the small firm is mostly directed by the competencies of the owner manager. Brown (2005) suggests

that understanding the attitudes and philosophies of the owner manager assists in the construction of a more complete picture of small firm e-business development.

2.4.5. Barriers to SME e-business Adoption

The most obvious barrier to e-business adoption in small firms is grounded in the competency and skills gap. Development of appropriate skills, under investment in staff training and poor knowledge of the Internet start up process were identified as central barriers to e-business implementation and growth. This has been confirmed in a number of studies (Smyth and Ibbotson, 2002, Quayle, 2002, DTI 2003, DTI 2004, Dixon et al. 2002). Thong (2001) suggests the limited amount of resources within the small firm serves as a barrier to adoption. Fillis and Wagner (2006) identified security and privacy worries, costs of consultants and lack of ICT competence. A small firm often views costs as prohibitive unless they can clearly see a competitive advantage (Clarke, 1997). Wai-Pun, et al. (1997) also identify a lack of trust and poor knowledge of the medium, insufficient skill in ICT and general lack of awareness of potential opportunities for its use as barriers. Hobley (2001) suggests that although the majority of small firms in Europe and the USA have access to the Internet, this does not necessarily mean that access is directly related to practice. Blackburn and Athayde (2000) suggest that barriers include finding difficulty with the design and upkeep of websites. Poon and Swatman (1999) proffer there is a low expectation of what can be achieved using e-business. Quayle (2002) suggests that many small firms are failing to develop an appropriate strategy and have not, as yet, realized the benefits of e-business. Wallace (2000) suggests there is some degree of dissatisfaction with the perceived failure to deliver the early promises of the new e-business approach.

Research on problems has tended to focus on external constraints to doing business (Katsikeas and Morgan, 1994). Internal factors are equally if not more important for the small business where firm and managerial factors merge to act as one due to the control exerted by the key decision maker, often the owner manager (Boone et al., 2000). Fillis and Wagner (2006) state:

It is equally important, therefore, to conceptualize and investigate internal impediments to e-business development as it is to incorporate external barriers in

any research on SME e-business development. In fact, it may be more beneficial to place greater emphasis on internal effects as the firm becomes smaller and smaller. Understanding intangible, qualitative factors is just as important as understanding quantitative, cost-based issues. Ultimately, the SME can overcome perceived and actual barriers to e-business growth by thinking creatively. There is a need for reaching a holistic understanding of the combination effects of hard and soft barriers that are grounded technologically and socially.

Once again we see that a holistic approach that favours a social and technological perspective is recommended. An understanding of the owner manager of a small firm is an important consideration when determining factors that may hinder e-business adoption. It is one of the aims of this work to go beyond the examination of panoramic external factors, though these will be considered and provide a holistic understanding of e-business adoption in the participant small firms. This work will consider the strategic development path of the small firm. The owner managers may have enabling or restraining elements and this may have an impact on ICT development within the firm. These will be considered in conjunction with the small firm's current relationship strategies and their relationship with the ICT provider.

In addition to these elements, environmental factors also play an important role. Fullers (2000) work describes how small firms react within the environment they exist in. The notion of co-evolution as described by authors such as Holland (1995), Kauffman (1995), Johannison et al. (1994) and McKelvey (1999) is likely to be particularly important in the small firm. Fuller and Moran (2000) suggest SMEs will adopt technology within the framework shown in Figure 1.

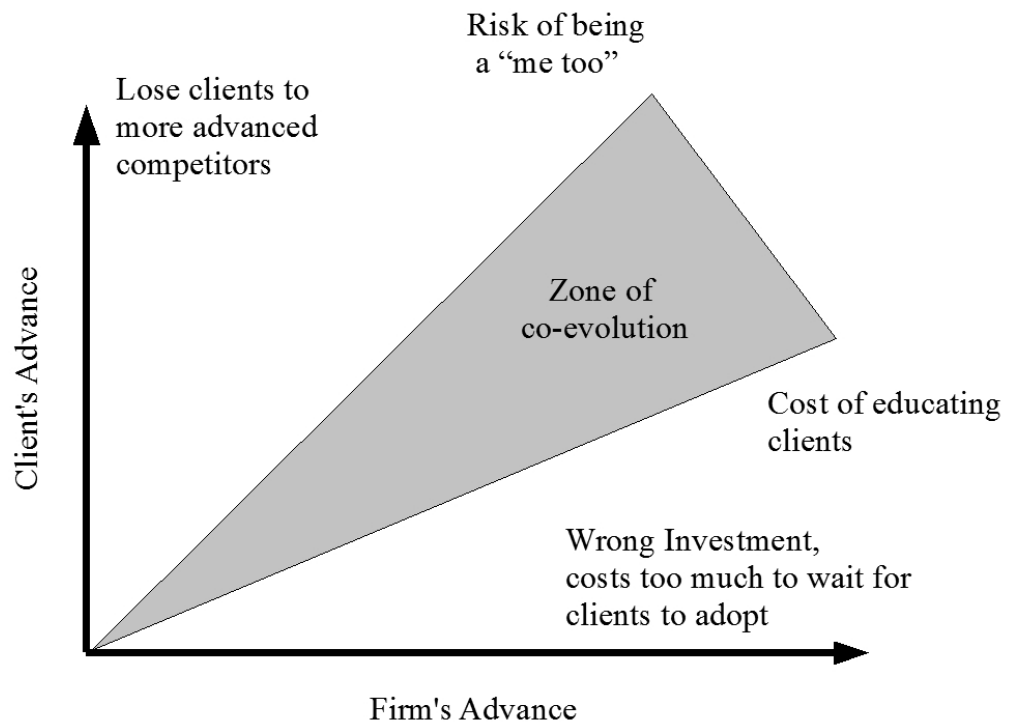


Figure 1 Risks and costs in co-evolution of e-business. Fuller and Paul (2000)

Fuller and Paul's research demonstrates that most small firms will choose to be in the zone of co-evolution, which is a balancing act or decision based on their current position or their relationship strategy with other small firms' customers or suppliers. This view is similar to that of Fillis and Wagner in the fact that it incorporates both positive and negative attitudes to e-business adoption. However, Fuller's model focuses in more detail on e-business adoption within the small firm's wider environment. This environmental consideration which examines the small firm's relationship to its clients leads to considerations of e-business small firms' ICT relationship strategies.

2.4.6. Small Firm ICT Relationship Strategies

E-business can have an impact on small firm's relationships (Brown, 2004). These relationships are with their customers, suppliers, large organizations, governments and other small firms. An important aspect of this work is the investigation into how e-business technologies impact upon and can be used by owner managers and small firms to facilitate relationships and relationship strategies. These relationships are not just in the business arena. Previous research often disregards the interrelationship between the social and the technological. This joint perspective though has been considered in a number of works, for example Law (1991), Grint and Woolgar (1997), and Fuller and Lewis (2003) Gray (2003). The most important aspect of these works and theories is their recognition of the interrelationship of the social and technological. Fuller and Lewis (2003) argue that the small firm cannot exist without its relationships, which influence the development of the firm and therefore its future. They show how different orientations to relationships displayed by the owner managers (different relationship strategies) were implicated in the choice of and use of ICT in the firm. Their evidence suggests that owner managers formulate and reformulate technology perspectives to make sense of their experiences of technology in different relational contexts. They are influenced by the social actions of co-users i.e., the owner manager, the business and its stakeholders. This theory enables greater understanding of other current theories of technology adoption and practices of ICT and e-business projects in small firms. From personal service to strategic development, ICT has a role and Fuller feels that to ignore the role of ICT

in relationships and relationship strategies is detrimental when implementing ICT in small firms.

Fuller's work defines the following as ICT technologies:

Telephone (with voice-mail facility); facsimile; mobile telephone; PC; networked PCs; Internet; electronic mail; ISDN; integrated stock control; electronic data interchange (EDI).

Fuller's work does not clarify some of the terms used for the technology. There is not for example a clear understanding in his work of networked PCs. It can only be assumed that this is where data is stored centrally on a server and many users have access to the same information and data. Underpinning the relationship strategies, Fuller has also identified a number of common themes in small firms which support these strategies:

Supply	The notion that the small businesses provided a "supply" or were "supplying" customers through their relationships.
Talk	A fundamental aspect of relationships; here we need to look at "talk" as a free flowing open exchange of information.
Trust	For relationships to develop, there had to be "trust on both sides" "trusting somebody" to do a task, or of having "trust in us".
Expectations	This theme is often linked closely with the word "trust". Expectations their customers had of them and how this whole system operated.
Build	"Building" relationships with suppliers (and with customers in some cases).
Personal	"Personal interplay", "personal contact" and personal "touch" and of course personal "Service". Who SMEs had contact with, and referred to suppliers as "people", e.g. "tend to stop with one person", and the processes as interpersonal, e.g. "some people you are clearly very formal with and others ... you're probably not very formal with at all".

Table 4 Fuller's Themes of ICT Relationship Strategies

Fuller developed this typology by adopting a 'grounded theory' approach (Glaser and Strauss, 1968), in which he maps the ICT used by small firms in his case studies against each relationship strategy. When the principles of grounded theory are followed, a researcher will formulate a theory about a phenomena they are studying that can be evaluated using observation and experience. Fuller's work does leave a

gap; there is no clear definition of the networked PC and its role in small firm relationship strategies when employing more complex e-business applications. It is hoped that this work will address some of the issues raised. In particular how relationship strategies are impacted upon as a small firm progresses through to more complex e-business applications and processes.

2.5. E-Business Opportunities

This study now turns to the advantages that a small firm may gain by adopting e-business. It begins by detailing the potential benefits of adoption and then places this in the context of wider academic thought on the impact of the digital economy and digital age may have on society as a whole. Drawing on this work it then seeks to examine how this may influence the small firm and seeks to identify how small firms could use this knowledge to their advantage.

Fillis and Wagner (2006) found that the main potential benefits of e-business related to improved communication, establishing competitive advantage, and access to new markets, including international opportunities. E-business has the potential to impact on every aspect of current business processing as well as providing new routes to market for a small firm. Sterne (1995) identifies the potential for improved company image and customer relations, increased market visibility, cost reductions, customer acquisition, market expansion and improved internal communications. Ellsworth and Ellsworth (1995, 1996) also identify factors such as improved communications, logistics, competitive advantage, cost savings, collaboration, and information search and retrieval, marketing and sales promotion. Poon and Swatman (1999) found that it was the perception of future benefits that was driving small firm Internet commerce.

Systems that were very expensive a few years ago are now an affordable option for a small firm. This coupled with affordable network connectivity means that small firms can now enter market places with relatively low set up costs. Tse and Soufani (2003) believe that small firms have a major part to play in the “new economy”. Tapscott (1996) sees the new economy as a development of the digital age. He views the new economy as earmarked by relationships, networks, and information. Tapscott (1996) provides an insight into this, and explains an inextricable linkage among the

new economy, the new enterprise, and the new technology. He suggests 12 themes that govern this linkage.

Knowledge is everything in the new digital age. A “knowledge economy” Consumers are now more aware than ever before and professional workers outnumber labourers 3 to 1 in the US.	Convergence Computing Communications and media industries are converging to become the leading economic sector.
Digital not analogue - email not post office.	Innovation "Obsolete your own products." If you don't do it first, your competitors will. If it isn't broke, break it before your competitors do.
Virtual means physical things can become virtual -- virtual ballot boxes to the virtual job.	Presumption through customisation combining production and consumption. This is where suppliers and vendors work together to create and supply new products or variations of products. Computing systems allow for a far greater degree of flexibility in the manufacturing and supply.
Molecularisation of old organizations is replaced by dynamic clusters of individuals.	Immediacy becomes a key driver -- just in time is everything.
Internetworking through cluster networks rather than hierarchies.	Globalisation with Trans-national systems. Everyone can with new technology have global company.
Disintermediation of the middle functions between consumers and producers are being eliminated through digital networks.	Discordance issues are rising due to unprecedented social conflicts. The advent of the digital age will raise questions about privacy, access and Tapscott feels has the potential to impact on the future of the democratic process.

Table 5 Tapscott (1996) 12 themes of the Digital Economy

Tse and Soufani (2003) suggest that of Tapscott's 12 themes, some are more appropriate than others when applied to strategy formulation for small firms. These being: Virtualisation, Molecularisation and Disintermediation. These concepts deal with market reach, penetration and consolidation and therefore apply to strategy formulation.

2.5.1. Virtualisation

Virtualisation relates to the phenomenon in which transaction processes are conducted electronically while products remain predominantly physical. Stone's Internet State 3 (transact) has to be reached for this to take place fully.

To reach Internet State 3 a firm must have the capabilities of the Internet State 1 and 2. In State 1 (access) we see e-business as a method to extend market reach. Network technologies are used to communicate with customers, suppliers' staff and those in the extended enterprise (accountants etc). This allows the staff to email and gather information. In State 2 (publish) We see a multi page web site is used to inform customers and others about products etc, but transactions being done by other means (phone or fax).

In State 3 (transact) customers, suppliers and/or employees carry out transactions on-line. Existing stand alone applications may be adapted with a browser interface to be available on the Internet. These 3 Internet States combine to offer a virtualisation of the firm's activities and services.

According to Evans and Wurster (1997, 1999) virtual markets are characterised by high reach and richness. Reach relates to the number of customers with whom an entity can connect. These customers include suppliers, consumers, vendors, and indirectly competitors. Richness refers to the high level of detailed information companies and customers can communicate between each other.

E-commerce is often used to lower transaction costs for the firm. This is achieved through the costs savings gained by automated on line processing. However Tse and Soufani (2003) suggest that the idea that lowered transaction costs could attract consumers by offering a lower price is flawed. Blackwell and Stephan (2001) suggest that what consumers are seeking is neither the use of new technology to do shopping nor low price though it is important. The customers used in their study stated that what they value most is enhanced convenience, increased decision-making power, and better selection. This contradicts Blackwell and Stephan (2001) who feel that consumers are looking for choice and convenience. Lumpkin's (2002) work informs us that virtualisation is relatively simple to achieve and that other companies can enter the business or market with equally little effort. Porter (2001) views this as the

great paradox of the Internet because the very benefits of the technology making information widely available, means that competitors can be equally competent in doing the same. Virtualisation can impact different business types in various ways. Commodity goods are hard hit as customers focus on price and care little about the seller. De Figueiredo (2000) suggests that firms selling 'look and feel goods' (such as textile products and grocery) with variable quality have the lowest probability of new entrants in the market. This is because Internet based shopping does not allow for other senses to become involved when deciding or making a purchase. When selling textiles and fabrics it would be very difficult or impossible to convey the feel and touch of the fabric.

Tse and Soufani (2003) conclude that the Internet is a valuable tool for disseminating information about a company and the goods or services it sells at very low cost. Stone (2004) suggests the following is critical for success in virtualisation: value proposition is naturally important. He highlights that perishable goods present obvious problems. Some goods may be best sold via another medium, heavy goods may cause problems due to expense when delivering. In such cases it may be better to offer information about the product or service and undertake the transaction by other means.

Tse and Soufani (2003) and Stone (2004) agree that multi-channel customer management is vital. Therefore to sell goods on line it would be prudent to have a physical postal address, contact telephone and fax numbers. In many industries, customers expect consistent sales and services over all channels, both physical and virtual. They also suggest that when a firm enters e-commerce there are strong arguments against using the web as the only means of transacting. Stone further suggests that web site quality is of great importance. There are many aspects to the quality of web sites, for example usability, resilience, security, and continuity of service. All must be of a high standard if the e-business value proposition is to be well-received in practice. He finally adds that culture, language and geography are important. Despite the global nature of the World Wide Web, the reality is that geography creates huge differences in culture and of course language. Successful e-businesses recognise that different web sites are required for different audiences.

Tse and Soufani (2003) also see the use of the Internet to be an effective medium for disseminating and collecting information, as well as taking orders. Dussart (2001) also suggests the Internet is very effective in displaying the strategic use of information and communication with customers. It is not difficult for a small firm to reach Stone's State 2 (publish) and therefore reach some degree of virtualisation of information.

Tse and Soufani (2003) also recommend the use of the Internet to enhance customer relationships. It is all too easy to see the Internet as a means of attracting new customers (Steinfeld, et al. 2002). The Internet has a huge potential for enriching current customer relationships. This could be done by giving a superior service (Barua et al., 2001) or by providing additional information. Customers can also be given more control over the purchase, by 24 hour shopping for example. Slywotzky and Morrison (2000) suggest this can be achieved by giving the customer more choice on design and delivery options etc. Walsh and Godfrey (2000) view personalisation to be a vital tool in establishing customer relationships through targeted advertising and one on one marketing.

Virtualisation of goods and services can increase the amount of customer data available, thus Customer Relationship Management (CRM) is a useful tool for small firms. Firms can establish "virtual communities" for customers. These may lead to relationships between customers themselves. Hagel and Armstrong (1997) and Hagel (1999) argue that they are very powerful tools in drawing individuals with a common interest together. They themselves add to the customer experience (The Economist, 1997). Walsh and Godfrey (2000) believe that these communities and targeting offerings (promotions sales to specific groups) increase repeat buying. There are counter arguments to this. Brynjolfsson and Smith (2000) feel there is no reason to return to a site if you can get the goods cheaper elsewhere even if you have left feedback (a message on the site for other users or the vendor) on the purchase of a product or service. Virtual communities take time to visit and not all consumers may want to invest in this time.

2.5.2. Molecularisation

Molecularisation refers to the phenomenon that the economy is breaking up into very small units as a result of the dramatic improvement of access to quality information obtained on the Internet. Tapscott (1996) suggests that the principle economic unit of an industrial economy is the corporation or large company. He predicts the break up of these organizations due to proliferation of the Internet. Hartman and Sifonis (2000) see vertical integration by large companies as no longer necessary for control of the market. Instead large companies could tap into key areas and small firms could provide the services needed. Downes and Mui (1998) and Hartman and Sifonis (2000) also suggest that there is no longer a necessity to integrate various activities into a single business to achieve efficiency. They proffer that strategic networks consisting of different players in the market have become an essential form of organization. This network perspective is important in understanding e-business. If the new economy is to decentralise as many predict it would favour the flexible agile small firm. Small firms could be quicker in positioning themselves to take advantage of new opportunities.

In the digital age ICT and the Internet enable large companies the potential to offer business processes, products and services through the Internet and networks to others with whom it was not possible or practical to do so previously (Lucking-Reiley and Spulber, 2001). This represents an opportunity for small firms to enter new markets and the potential to reach a new customer base by undertaking these services. Technology can be outsourced to undertake routine or specialist tasks leaving staff at the large firm to concentrate on their core activities such as account management or marketing strategy (Slade, 2000).

Thus with the Molecularisation of the economy a small firm could join different networks and establish new relationships. Courtney (2001) suggests it is vital in the constantly and rapidly changing economy, as a company can fare better by being highly flexible and developing a richer set of feasible alternatives. Keely (1998) points out that:

The amplification of relationships has become the central economic imperative of the networked economy.

Keely clearly places a very high value on relationships in the new economy. He feels that a firm's set of relationships will rise in importance to such an extent in the new digital economy that it becomes a prime economic driving force. A firm's set of relationships are important in any firm not just those based in the digital economy, though it may be questionable to see them as the prime economic driving force.

To take advantage of the potential of molecuration Tse and Soufani (2003) suggest a firm stays flexible and define flexibility in two ways. First, in the new economy, constant rethinking and dynamic planning might be more promising than long range planning. Downes and Mui (1998) agree. This type of planning reflects the work of Wyer (2004) who believes that the application of formal, rational long range planning models is inappropriate to small firms. Small firms operating in this environment need to be agile and respond rapidly to events. The deployment of long term planning with a small firm may hinder its ability to be flexible.

The second definition is that small firms can and should join many networks. ICT creates the potential to do this, thus increasing options for the small firm. However, small firms would need to be wary of the following factors. When joining networks with a large firm they would almost certainly retain control and may require the small firm to use specialist ICT systems which may incur costs. The large company would be the central controller (Gnyawali and Madhavan, 2001), thus the small firm would have less influence. The commitment and possible contract required to enter into such a centralised network with the large company at its core could be compromising in a number of ways. For example, the small firm would have reduced negotiating power and it would commit a large part of its resources. This would reduce ability to be flexible.

2.5.3. Disintermediation

Tapscott (1996) refers to the phenomenon of disintermediation in which traditional intermediary businesses are circumvented and some traditional industries begin to disintegrate. This is the consequence of the emergence of networks. Evans and Wurster (1997) argue that as everyone can now communicate with everyone else some intermediaries have become redundant. This reflects Stone's notion of the result of a transparent market place. As the traditional models and value chains evolve and

possibly break up there is potential for a small firm to exploit this. Slywotzky and Morrison (1999) suggest that a small firm could become a new intermediary and create new value propositions for the customer by providing, first, new value-added services not yet offered, and second, more efficient means of transacting business. Examples of this are wholesalers selling direct to the public via the Internet or by small firms creating new packages of services or products that provide a unique specialist product offering.

In order to take advantage of disintermediation Tse and Soufani (2003) suggest that a small firm could explore niche markets. The Internet provides information equally to large and small firms alike but the potentially more dynamic nature of some small firms means they are in a better position to exploit new opportunities that arise. They can move in and out of the market place much faster than a larger firm. They have the potential to exploit these new opportunities in the digital age that were not previously available.

To adopt any of the recommendations of Tse and Soufani, Stone and others the firm would need to have e-business deployed at Internet State 3 (transact) to offer many of the services to other organizations. The notions of Tapscott (1996) and others challenge the traditional make up of a firm and indeed the whole economic structure of organizations. Small firms would need to be able to understand these notions and the potential advantages for the small firm. This may only occur if they understand the e-business systems that provide the mechanism. In many small firms this review has shown this is not the case. Outside of technical considerations a cultural shift may have to occur within the firm to realise the firm's potential. As such many small firms may not wish to adopt this avenue of e-business development. For many small firms the migration to e-commerce and the use of customer relationship management may be sufficient. This keeps the locus of control within the firm and owner manager. Those firms that choose to accept the Molecularisation via e-business may already be familiar with this concept within their businesses. E-business may present means of widening their potential customer base via electronic means of receiving and management of clients and customer work. If they can identify means of offering their services to new clients in innovative ways then they may find disintermediation useful. Naturally this will vary by industry sector. Many firms may also view e-

business evolution as a means of increasing efficiency within their own firms. Through the consolidation of business processing focused internally. It may be a combination of all of the above. It could be the evolutionary process itself through Stone's Internet States that can allow small firms and owner managers to see the potential for e-business in other areas not originally considered. This will be examined in the case studies.

2.6. Application Service Providers (ASP's), Clusters and Networks

This work now turns to the concept that e-business evolution can be gained from outside the traditional boundaries of the small firm. This is achieved by the use of an Internet connection that allows a small firm to engage with others through varying means. Thus an important consideration when researching e-business in small firms is their participation in clusters, networks and the use of Application Service Providers (ASP).

The use of Application Service Providers can impact on a small firm in several ways. Application Service Providers are companies that supply software applications and or software-related services over the Internet.

An Application Service Provider:

Manages and delivers application capabilities to multiple entities from a data centre across a wide area network. Wainwright (2000)

Currie (2003) highlights the fact that in the first wave (mid and late 90's) Application Service Providers did not have significant success in the small firm marketplace. They offered a one to many model which in reality was a same for all model. The complex systems Application Service Providers offered to the small firm market were originally designed for large companies and offered a variety of applications which were not suited to the small firm environment. This was due to their over complex nature. Simpler systems such as email did not offer enough value to be employed and were already offered by Internet Service Providers.

However more specialist small firm market places have had more success. Lockett and Brown's (2003) research in the dairy farming industry shows that small firms can

and do use complex ICT within specific industry sectors. Their research shows that users of Application Service Providers have significantly higher levels of engagement in e-business applications, regardless of application complexity, than non-users in the wider industry. A key point is that in the research the small firms relied upon the researcher providing the technology. The researchers provided all the resources needed to enable the project. They also positioned themselves as a resource for advice and engendered the trust of all the participants in the study. The concept of trust has been studied in a variety of situations. Kohala and Coast (2009) describe one form of trust as:

“An assumed reliance on some person or thing. A confident dependence on the character, ability, strength or truth of someone or something.”

This definition implies that the person is reliant on another for something, and is depending on the ability of that person to perform the task. A statement to illustrate this kind of trust will be “I trust you to do this job for me.” This definition of trust implies a work relationship between the two individuals. Such a conceptualisation of trust informs the approach to this study.

Tse and Soufani (2003) recommend a range of applications and strategies for small firms to engage in the digital economy. However they do not examine the location of the ICT services or applications. Broadband connectivity allows for the adoption of networked applications and processes. Though Application Service Providers failed in the first wave, Currie (2003) suggests they could be in a position to facilitate a small firm through Broadband enabled connectivity. Yang and Huang (2000) suggest that the rapid growth of partial outsourcing practices, which are more flexible forms of technological integration, are particularly suitable for small firm needs. Arbore and Ordanini (2006) state that:

Combining internal knowledge with external outsourced technologies, SMEs may have access to an inter-organizational process of knowledge creation that, if well organized, effectively allows exploiting ICT potential at least for a certain period of time. In this sense, we are persuaded that ICT outsourcing may become an external way to facilitate the adoption of new technologies especially for firms facing internal and environmental constraints.

Application Service Providers then may have a valuable role to play in e-business development in small firms. However, Currie (2003) found that one hurdle to Application Service Providers adoption by small firms was the impersonal nature of the relationship between the Application Service Providers and small firm. The nature of the web interface between the Application Service Providers and small firm and the lack of personal contact contributed to the failure of Application Service Providers. Outside of the technical considerations that these technologies employ, there are sociological considerations and the relationship strategies small firms utilize in these situations (Gray 2003, Fuller 2000, Fillis and Wagner 2006). This is important, as Fillis and Wagner (2006) emphasise:

Important entrepreneurial marketing competencies that have been found to be central to e-business development include vision, the development of trust within personal contact networks and technical ability and control.

Fillis and Wagner highlight several important issues, trust, technical ability and control. If an Application Service Provider is to be trusted then consideration needs to be given to control issues of the technology. This may well be best managed via an appropriate relationship strategy between the Application Service Providers and the small firm. This work will examine this issue within the case studies.

Lockett and Brown (2006) suggest that medium and higher complexity e-business applications are essentially collaborative in nature. Following this premise it can be seen when examining Stone's Internet States that anything above State 2 (publish) becomes collaborative in nature. This collaboration is achieved via the networking of ICT. ICT networks beyond Stone's Internet State 2 (publish) reach outside of the small firm and may involve the joining of networks or clusters. Gray (2003) suggests this in turn leads to sociological and technical considerations. We have the technical considerations of managing the ICT system and the sociological considerations of the impact this may have on the small firm via its working practices and relationship strategies.

It is therefore important to examine the nature of clusters and networks and how these may impact on small firm relationships and relationship strategies, and their possible influence on the firm's behaviour.

Shaw (2006) feels that there is a gap in knowledge and understanding of a network and its relationship to the small firm. The term network has been applied to a range of small firm interactions. Examples of these include membership of formal network organizations (Chaston, 1995, 1996; Chaston and Mangles, 1997) and the personal contact networks of owner managers (Aldrich and Zimmer, 1986; Birley et al., 1989; Blackburn et al., 1990; Carsrud et al., 1987; Curran et al., 1993; Filion, 1990; Johannisson, 1986). Shaw (2006) questions the possibility of establishing a comparison of findings across a diverse range of networks and networking activities. Much of the research undertaken in this area has been quantitative (Aldrich, 1987; Aldrich and Reese, 1994; Birley et al., 1989, 1990). Many academics feel that there is a lack of understanding of the motivations of small firms to engage in networking (Blackburn et al., 1990; Bryson et al., 1993; Carsrud et al., 1987; Chaston and Mangles, 2000; Coviello, 2005; Curran and Blackburn, 1994; Curran et al., 1993; Fletcher, 2002; Gibb, 1993; Hoang and Antoncic, 2003; Joyce et al., 1995). This may be due to the quantitative nature of the work undertaken and a qualitative approach may add to the body of knowledge by applying a combination of social and technical theories. This work uses the term networks as defined by Gulati et al. (2000). A strategic network is:

A firm's set of relationships, both horizontal and vertical, with other organizations be they suppliers, customers, competitors, or other entities including relationships across industries and countries.

This work examines networks in terms of the impact they have on current relationships and the development of new relationships. In many micro and small firms there is a potential link between the personal contact networks of owner managers and those of the firm. This may be due to the size of the firm where the boundaries between the firm's relationships and those of the owner manager relationships are intertwined. This link has been examined in a number of works (Aldrich and Zimmer, 1986; Birley, 1985; Birley et al., 1989; Curran et al., 1993; Hite and Hesterly, 2001; O'Donnell and Cummins, 1999; O'Donnell et al., 2001; Shaw, 1999). Research has also examined how the owner managers of small firms use their personal contact networks to maintain relationships and facilitate financial

transactions for the small firm (Aldrich, 1987; Aldrich et al., 1986, 1989; Birley et al., 1990). This is also highlighted by Ostgaard and Birley (1994), who stated that,

The personal network of the owner-manager is the most important resource upon which he or she can draw.

This is important to this work because these relationships may be impacted upon by ICT above Stones State 2 (publish). Fuller and Wagner (2006) state:

Competitive advantage often emerges as an unplanned phenomenon and e-business strategic advantages often result from successful exploitation of personal networks and competencies.

This work will examine the impact of utilising the personal contact networks of the owner manager of a small firm in relation to Stone's Internet States. As small firms use ICT to transact (State 3), the use of the owner manager's personal contact networks to facilitate relationships may be affected by the distant nature of the ICT processes. This may cause problems. Fuller (2003) in his case studies concluded that two key attributes were present in all 5 relationship strategies, namely 'trust' and 'expectations' – having trust/expectations in/of one another as customer and supplier; being trustworthy and experiencing trustworthiness. Fuller's work examined the notion of trust and how relationship strategies can change through technology and in what ways 'trust' is implicated in technology enabled relationships. Fuller concludes that expectations and trust are present in technology enabled relationships. Fuller also suggests that ignoring socio-technical relationship strategies, that is, how any proposed ICT is used in current and new relationships is detrimental to small firms when adopting ICT. He offers the theory that this may be a factor in the varying rates of ICT adoption in small firms.

Gray (2003) suggests that the key to effective and productive cooperation lies in small firms' capabilities for networking. He goes on to suggest that the main economic advantages of networks for small firms lie in the capacity for sharing knowledge and risk about markets, impact of regulations, products, supplies and so on. These activities are often too time consuming to be carried out effectively by small firms, who have less access than large firms to useful information. Many academics also agree that networks and clusters can also be used as resource for a small firm (Aldrich and Zimmer, 1986; Barnir and Smith, 2002; Eckhardt and Shane,

2003; Fiet, 1996; Fuller-Love and Thomas, 2004; Greve and Salaff, 2003; Johannisson, 1986; Shane and Venkataraman, 2000; Szarka, 1990; Waldinger et al., 1990).

Gray (2003) also looked at how different networks of micro firms are using Broadband. 80% of small businesses he studied joined networks of one sort or another, from social/community networks to business networks. Gray suggests that all networks are very important for small firms. When examining business oriented networks, such as industrial districts, regional and industry clusters, supply and value chains, and hub networks, he classified them in the following way:

<p>Hub Firms A lot of activities in a hub-and-spoke model take place centrally, with small firms dependent on the central firm. There need not be contractual relationships; they could simply be habitual. The model works with the central firm as a very important as diffuser of innovation. The strength of the relationship is based on frequency of contact and strength of ties. However, strong ties are not necessarily good; the often channel flows just one way and gets in the way of flexibility, which is normally the small firms' advantage.</p>	<p>Network Firms The relations are much more two-way in a network, with transaction/exchange of information, services or goods. The interactions are between other members, not just through the hub. Networks are good at disseminating information. One of the effects of Broadband is that it strengthens these ties and speeds up interaction. Collectively, they can now decide how to use information. Small firms may not have time to evaluate, relying on what other firms advise. Thus, the more interactions they have, the more opportunities they have to gain information and exchange scenarios on improving performance. Networks are hard to control from a policy point of view.</p>
<p>Clusters Clusters are less formal relationships, agglomerations of people offering complimentary professional services or products. They often exist owing to distribution advantages and, typically, although they cooperate, they also compete.</p>	<p>Associations Associations are very important for businesses even if they have infrequent contact with them. Many businesses join chambers of commerce etc and the mere fact that a channel of communication exists provide confidence. Associations also provide a trusted source of information.</p>

Table 6 Newtime classification of business networks

Lockett and Brown developed an e-trust platform and have attempted to conceptualize the role of ICT within a network which Gray does not address. This is shown in Figure 2 which is missing from Gray's model.

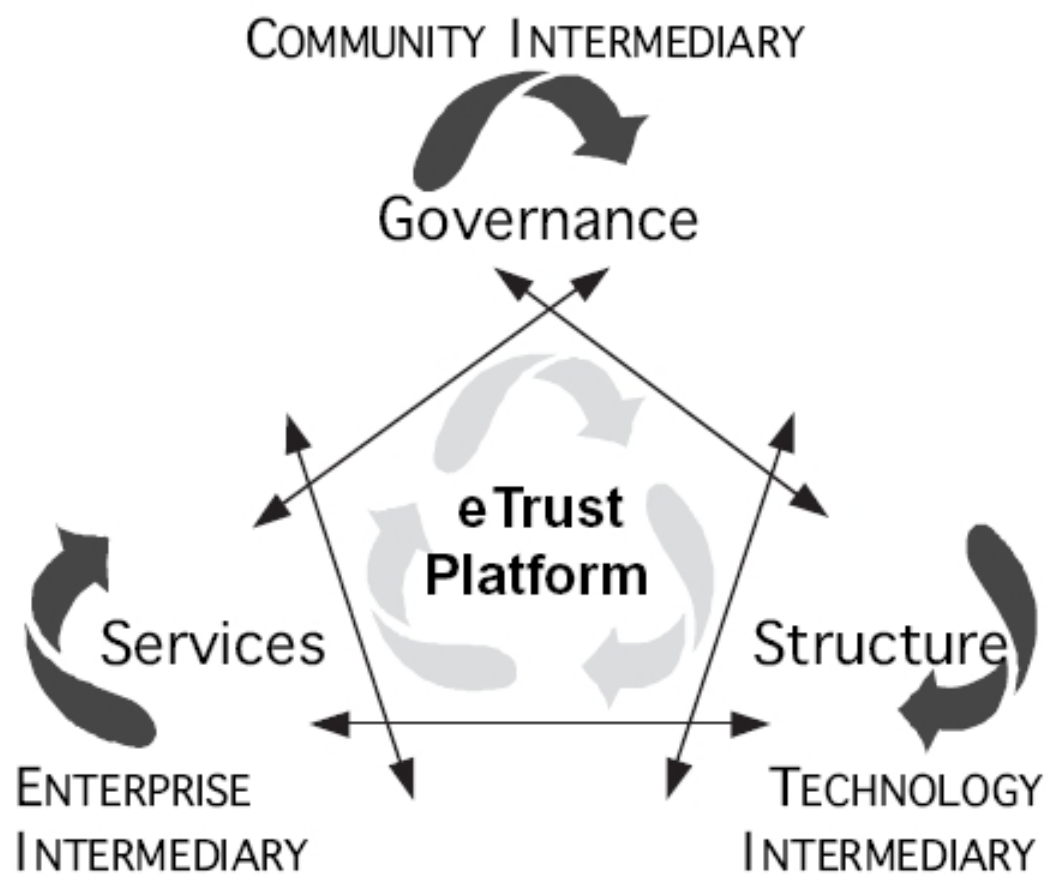


Figure 2 Trust Platform (developed from Brown and Lockett, 2001)

There are three kinds of intermediary. The role of the technology intermediary is to provide the ICT platform on which services can be provided and could include hardware, security and communications. The role of the enterprise intermediary is to provide the services including applications software, hosting and consultancy. The technology and enterprise intermediaries can be considered as generic. These functions could be provided by one or more organizations. The community intermediary, however, is specific to a particular network or cluster. It has a critical role in gaining the commitment of potential participants to enter the e-aggregation and can be considered as a trusted third party. Lockett and Brown when considering the role of the technological intermediary place emphasis on trust and trustworthiness. However they do not consider the relationship strategies that may be employed by the technology intermediaries (ICT providers) to facilitate a successful e-trust platform. At some levels this is not appropriate or needed, it is assumed. For example in government information portals, trade associations and regional organizations such trust and credence is assumed. The small firm may not even have a choice in selecting the ICT provider or even be aware of their role. Where there may be a need for ICT relationship strategy considerations is when the ICT provider is facilitating a smaller e-trust platform created and facilitated by a small firm as the principle player. This is where a small firm or ICT provider becomes the community intermediary and assumes the role of the trusted third party. This will be examined in the case studies.

2.7. ICT Security and the Evolution of E-business in Small Firms

Many small firms feel that to engage in e-business presents security risks for the firm. It is this important issue that this review now examines. Efforts have been made, not just by ICT suppliers and retailers but also by banks and government to encourage small firms to adopt e-commerce and to go on-line for financial transactions and dealings with government. That advent of always on (and therefore always vulnerable) connections has increased the potential for security issues. Small firms present a particular concern in the electronic economy. They commonly have neither the ICT or security expertise time nor funds to devote to securing their systems. Reports in the media on the scale and consequences of security breaches

coupled with the lack of planning when implementing ICT (Dixon et al., 2002) have compounded the problem.

The UK government's response to this problem was to commission the EURIM - IPRE E-Crime Study "Addressing the needs of small firms and others without in-house ICT or security skills". This was one of a series of discussion papers that attempts to co-ordinate ICT suppliers, government departments and related industry sectors to address the issues of e-crime and ICT security needs in small firms.

2.7.1. Security Policies

There are several ways to tackle the creation of a security policy. In general these are guidelines, check lists and risk assessment. It is known in the literature that small firms are poor at risk assessment (Dimopoulos et al. 2004). In 2000 nearly one third of all businesses had never carried out a risk assessment, most of which were small firms (NCC, 2000). Small firms also face limiting factors when considering risk assessment. These are limited budgets, lack of expertise (Hoo, 2000), and lack of awareness and small firms view risk analysis as too complex (Shaw, 2002).

EURIM's studies highlighted common areas of concern to most small firms using computer systems when addressing security needs. This advice was offered to the public through the office of the National High Tec Crime Unit (NHTCU) and other portals. They offer advice and what action to take for each possible scenario based on EURIM's findings.

The EURIM report and the guidelines that stem from it give advice to a firm in a static state of ICT development. They do not offer advice to firms wishing to evolve and develop ICT systems. This work will examine small firms and ICT development during ICT transition and development.

This work examines through our case studies the practical implications of developing secure ICT systems and general security issues for small firms wishing to enable or evolve their ICT systems. This is examined in terms of the location of the services and within the context of the case studies. This new perspective on security provision to small firms may enable them to consider matters of security based on the location

of the services and thus give them the opportunity to move forward in their e-business evolution without undue security concerns or employing specialist security staff.

2.8. Personal Construct Theory and the Small Business Owner Manager

This work has highlighted the pivotal role the owner manager plays within the small firm. This section of the review seeks to examine ways of understanding how an owner manager operates within the context of the small firm's activities. In many small firms the owner manager has a great deal of control within the organization. His or her influence is a key factor, and many academics agree that to gain an understanding of the owner manager provides crucial insight into how a small firm operates. This work uses Personal Construct Theory (PCT) as foundation for enhancing understanding of owner manager behaviour and perspectives and therefore of the small firm. In 1955 George Kelly published his work "The Psychology of Personal Constructs". This was the culmination of more than twenty years work in psychology and is the synthesis of Kelly's own experiences, not only in the practice of clinical psychology but also in his educational background. The Psychology of Personal Constructs was introduced as a new approach to psychology which focuses on the meanings that people attach to persons, situations and events they encounter. These meanings, the "personal constructs" of a person, serve also as guidelines for the actions one takes to cope with the demands and challenges of life. For Neimeyer (2006)

PCT is therefore not just another "cognitive theory of personality" as some have written but refers to a much wider view of the "human condition".

Personal Construct Theory provides an integrated overview of the nature of the person and is based on the premise that people endeavour to anticipate the future (Woods, 2006). According to Kelly we live in two basic worlds. Firstly, the world that exists outside of any human understanding and secondly, the ways in which we interpret this primary world to be, in the form of representations or constructs. Kelly

sees the person as a scientist who through a series of progressive approximations tests his constructions in a piecemeal fashion in order to establish their predictive efficiency. In this way our interpretations about the universe can, with time, be scientifically evaluated as long as we remain open to invalidating evidence. Peirce (1955a) suggests that this robust scientific approach will be valid as long as

...A scientific spirit requires a man to be at all times ready to dump his whole cartload of beliefs, the moment experience is against them. The desire to learn forbids him to be perfectly cocksure that he knows already Peirce (1955 a); and that:

A good scientist tries to bring his constructs up for test as soon as possible Peirce (1955b)

Kenny (1984) agreed with this perspective and spent a great deal of time differentiating between good and bad personal scientists. Kenny (1984) states:

Kelly's preferred image of the person was to see him as a scientist, by which he meant that it is not only the professional scientist who wants to predict and control the universe, but that every human person has a similar aspiration. From this point of view everyone is involved in seeking to predict and control the flow of events in which they are involved. Each person has expectations, anticipations, hypotheses to test and experiments to conduct. The individual differences that we find between alternative personal viewpoints are the type of differences which are to be found in the theoretical disagreements among scientists, and it is these differences which lead us to attempt different experimental enterprises.

If in Kelly's terms we were all good scientists then we would not have any problems changing or re-evaluating our constructs of the world. However, this is not always the case. Kelly (1955) suggests there are times:

....when a person hesitates to experiment because he dreads the outcome. He may fear that the conclusion of the experiment will place him in an ambiguous position where he will no longer be able to predict and control. He does not want to be caught with his constructs down.

More importantly Kelly's view of human learning and its limitations is put forward in terms of the idea that you can learn only what your framework is designed to allow you to see in events. You must have a question in order to perceive an answer, hence one of the possible problems with education where teachers are providing answers to

questions which the children have not asked. Placing this in terms of the locus of control that is exerted by an owner manager within a small firm we see that the personal constructs of the owner manager have a direct bearing on the firm. This influence will affect the firm's relationships, growth, and development context.

Personal Construct Theory is principally used in the Therapy and Health Care context. Over the last fifteen years, however, a small group of practitioners have extended its use into the domain of business organizations (Brophy, 2006). Areas where Personal Construct Theory is used are diverse and cover a wide range including Coaching and Counselling, Training and Development, Interpersonal Relationships, Group and Team Development, Goal Setting, Role Clarification, Organizational Structure, Management Processes, and Functional Processes. Personal Construct Theory has been utilized in the examination of entrepreneurial behaviour (Woods, 2006; Hisrich and Jankowicz 1990, Watson, 1995). It has also been used in a range of business applications and in over 3,000 other studies ranging from children's understanding of physical science principles and consumer preferences, to formal structures of self-reflection (Neimeyer, 2006). Wyer et al. utilize the key premises of Personal Construct Theory to inform approach to enhancing understanding of strategic management in small firms (Wyer and Mason 1998; Wyer et al. 2000; Wyer and Barrett 2002; Wyer et al. 2003a; Wyer et al. 2003b). They feel that underlying assumptions of Personal Construct Theory raise key questions with regard to small business strategic management, and the strategy development processes. A review of Kelly's Personal Construct Theory highlights its potential within this study to help facilitate examination of owner manager uptake of ICT both with regard to strategic development and day to day operations of the participant case study businesses.

2.9. Small Business Strategic Development and Strategic Management

The final section of this review draws upon small business development insight embedded within the strategic management literature as frames of reference for

informing the ultimate empirical examination of ICT implementation into the small business development context.

Whilst the terms strategy, business strategy, strategy formation and strategic management are freely, and often interchangeably, used in the small business development context within academic management journals and texts as well as 'how to' management books, it can be argued that such terms are confusing and even rather grand and beyond the vocabulary of many small business owner managers struggling with the vagaries of their day-to-day business pressures.

It can be similarly argued, however, that whilst such terms may be somewhat 'big business' and outside the daily dialogue of most small businesses, the requisite management activities and processes which such 'strategy'-type terminology implies are very real within any business no matter what its size or focus. For example, all businesses have to make decisions about the scope of the business activity they conduct or intend to conduct. All businesses have to cope with the uncertain external environment in which they operate and to act in the face of enabling or constraining impacts that such change environments throw up. Perhaps more important than the inappropriate 'strategy' terminology that is banded about in the literature toward small business, is the inadequacy of current understanding that use of that terminology conveys with regard to, for example, what effective strategic management looks like in successful growth-achieving small businesses; or how new strategy is determined or unfolded in such businesses.

Certainly progress has been made with regard to enhancing understanding of 'strategy' and 'strategic management' in the small business context. What can be argued to be essentially large company oriented strategic management knowledge bases within the mainstream management texts and journals offers valuable guiding insight for growth-seeking small firms. The purpose of this section of the literature review is to tease out understanding embedded within the existing strategic management knowledge base. This can provide informing insight with regard to a key integral empirical aim of this research. This is to examine how utilisation of appropriate forms of ICT by small business owner managers can help facilitate their attempts at strategic learning about and strategic control and management of their uncertain external operating environment. To achieve this research aim it is first

necessary to anchor in existing insight with regard to what is currently known about these phenomena. And it is to this that the following sub-sections turn

2.9.1. Characteristics of strategic decisions

Considerable confusion abounds, both within the literature and in management practice, as to the distinction between strategic and tactical decisions. Clear elaboration of the characteristics of strategic decisions provides sound frame of reference as to the kind of strategic learning, thinking and management actions a small business must undertake if long-term survival and development is to be achieved.

Johnson and Scholes (2000) provide an excellent overview of what characterises strategic decisions. Whilst arguably compiled with large companies predominantly in mind, such conceptualisation offers sound guiding parameters for the consideration of the challenges of strategy formation and strategic management in the small business.

Thus, for Johnson and Scholes, strategic decisions are concerned with the scope of the organization's activities (for example, decisions on what business activity to focus on; and geographical focus). They relate to the matching of the activities of an organization to the environment (identifying and acting upon sustainable development opportunities).

Moreover, in order for a business organization to seize external development opportunities, strategic decisions involve the matching of an organization's activities to its resource capability. This relates to achieving development through building on, and determining potential to extend, existing resources and abilities.

Often strategic decisions will have major resource implications (for example, purchase and implementation of new capital equipment). They are also likely to affect operational decisions, for example by setting off a ripple effect of other decisions throughout the organization.

Certainly in a large company context, strategic decisions will be integrated with values and expectations of stakeholders and those with power in the organization.

Indeed, earlier research work into small business development has suggested that many small businesses are no less 'political' than large companies, only that the nature of the political networks and interactions (Lawrence and Lee, 1984; 1989) differ (Wyer, 1990).

Finally, strategic decisions are likely to affect the long term direction of an organization. For example decision making as to whether to continue to focus on existing markets, products and processes activities or to investment, say in new technology, which would facilitate related diversification over time.

Lynch (2003) in his consideration of the key elements of strategic decisions reinforces Johnson and Scholes perspective as to the need for effective interface between organization and environment. His emphasis is on competitive advantage deriving from the exploiting of linkages between the business and its environment. Decisions that build out of an understanding of the linkages between the organization and its suppliers, customers, government and other external actors are important. These decisions may lead to strategies that exploit those linkages in a manner whereby the links cannot be easily duplicated. These can place the business in a superior competitive position vis-à-vis its rivals.

2.9.2. What is strategy and what constitutes strategic management

Griffin (2009) views strategic management as a

'Comprehensive and ongoing management process aimed at formulating and implementing effective strategies; it is a way of approaching business opportunities and challenges'.

For Griffin, a strategy is a comprehensive plan for accomplishing an organization's goals. And an effective strategy

'Promotes a superior alignment between the organization and its environment and the achievement of strategic goals'.

A traditional perspective of strategic management is that of a rational long-term planning process involving sequential step management actions requiring:

- Undertaking of an external audit of the businesses operating environment to reveal opportunities and threats.
- Conducting of an internal audit to build understanding of the firm's strengths and weaknesses.
- Completion of a SWOT analysis to determine the potential of apparent development opportunities identified and resource and skills ability to seize the opportunity and circumvent any threats.
- Formulation of assumptions about the firm's development capabilities given the likely operating environment (for example, likely levels of inflation, interest rates and exchange rates; and availability of skilled workforce).
- Determination of long-term development objectives and formulate predetermined development path strategies.
- Development of programmes and plans to facilitate implementation of the strategies.
- Subjecting of the implementation process to control and review.

Such a structured management process, it is argued, facilitates effective strategic control of the external operating environment of the firm in terms of: (a) identifying potential development paths and analyzing their feasibility and sustainability; (b) choosing from the identified alternatives the most appropriate path; and (c) implementing, controlling and reviewing the chosen strategic development option.

However, as Lynch (2003) emphasizes, there is fundamental disagreement between strategists (and within the academic literature) with regard to just how strategy can be developed or formulated. The rational long term planning model effectively promotes a prescriptive approach to strategy development. The step by step sequential management activities of strategic analysis; strategic choice and strategic implementation result in a process where strategy as a predetermined development path is rationally and logically produced. Such a prescriptive orientation toward

strategic management dismisses the possibility that strategy may emerge, say from the strategic learning actions and activities of the manager. It is to such an emergent approach to strategy formation and development that opponents of the rational model turn.

2.9.3. The various dimensions of strategy

De Wit and Meyer (1998) highlight the benefits of viewing strategy from the perspective of its various dimensions. In strategy process the focus relates to the questions of how is and should strategy be made. This could be guessed, analysed, formulated, implemented, changed and importantly by who and when. This dimension orients in particular to the prescriptive/emergent approach debate. However, the additional strategy dimensions emphasised by de Wit and Meyer help to put flesh on the bones of understanding with regard to strategy and strategic management. The second dimension of strategy content relates to what is and should be the product of the strategy process. Strategy content could be in the form of a resultant new area of market development such as exporting; or new product development; or diversification of existing business activity. That is to say, what is and should be the strategy content for the business under particular operating circumstances? The third dimension of strategy, strategy context which refers to those operating circumstances: that is, the strategy context of the firm and strategy context of its environment in which the strategy process and the strategy content are determined.

Pettigrew and Whip (1991) saw these three elements of the strategic decision as the axes of the same three-dimensional cube of business strategy decision-making. For Lynch (2003),

in most corporate strategy situations the context and content are reasonably clear: it is the process that causes the problem because process may influence the way that people in the organization develop and implement strategy'...' Process is often one of the more difficult parts of strategy development.

2.9.4. Uses and limitations of rational long term planning models

Study of the strategic management literature reveals significant criticism of rational long term planning modes of strategic management. One may take these as indication that use of such management approaches, both in management practice and by those support providers attempting to enhance strategic management practice, will be limited. However, an examination of the practical world of management development support suggests that the attempted application of the rational long term planning model remains to the fore.

Moreover, a significant thread of support for rational strategic planning forms of strategic management continues to run through the management literature. In a large company context, Lufmann, et al. Bower (1991) proffers the potential of such management approaches. Within a strategic marketing orientation, McDonald has developed an excellent base of insight from 1980 onwards depicting the strategic marketing planning process and strategic tools to facilitate and underpin this process (see for example, McDonald, 1996). McDonald (1980) suggests that business problems do not lend themselves to the highly structured analytical methods found in the sciences. It is the very complexity of business problems that point to the need for some kind of structured procedure to aid problem identification. The rational long term planning model, in theory, offers step procedures for identifying and dealing with the complex problems embedded in the contemporary external change environment (Wyer, 2009).

Within a small business development context, for Fry and Stoner (1995), rational strategic planning is a powerful management tool capable of helping the small business competitively adapt to anticipated environmental changes.

It is perspectives such as these which perpetuate support for the ongoing 'teaching' and attempted implementation of rational long term planning modes of management by private business support providers and government agencies such as the Regional Development Agencies and their Business Link support delivery arms.

However, it is the embedded weaknesses and limitations which surround such rational planning modes of management that have triggered attempts at conceptualising strategic management and integral strategy formation activities from

different perspectives. For example, Stacey (1993) highlights how the success of tidy, step management process based on rational strategic management is dependent on analysis of information on the recent past and current circumstances. Strategic plans that derive out of such management processes cannot explain the future. The rational strategic management approach in effect uses insight from the past and present as foundations for developing the business into an unknowable future.

Integral to managing in such a way is the very weak assumption that the rational planning process can accommodate open-ended change (as well as closed and contained change situations). For Stacey (1991) business organizations face an external environment that is embedded predominantly with open ended change situations. These possible changes are unknowable and unpredictable in timing and consequences. Within such a change environment business organizations simply cannot plan successful long term pre-determined development paths. If they adopt long term planning the unknowable nature of their external environment may bring into question the viability of such actions and strategies. To compensate for this they may wish to develop managerial learning abilities and create a different organizational culture. This culture should foster the capability to more readily act upon and within unknowable open ended change situations.

Thus, rational long term planning modes of management will have limited utility within all organizations, large or small. Moreover, within a small business development context, the work of Wyer (1990; 1997, 2002; 2004; 2008; 2009) highlights how small firm lack of resources, management abilities and the facing of potential unique problem types intensifies restrictions on management capability to rely upon rational strategic management approaches and integral logical, analytical thinking modes. Indeed, the integral assumption of universal utility of rational planning models across all organizations also falls short in that traditional linear models are too formalised for many small businesses. For example, see the work of Carson (1980; 2000) emphasising the informalities and idiosyncrasies of small business management processes.

2.9.5. Insight from alternative schools of strategic management thought

It is apparent that the rational long term planning model of strategic management in its 'pure' tidy step process form has severe limitations. However the body of academic management literature which propounds the model does provide outline insight in the form of approximations of strategic control actions which management needs to undertake. Importantly it incorporates knowledge capable of providing guiding frames of reference to assist the practicing manager.

However, over recent years alternative perspectives and prescriptions have begun to emerge in what are now being considered alternative schools of strategic management thought. For example, Mintzberg et al. excellent summary (1998) of alternative schools of thought depicting prescription and description of what strategic formation within business organizations should or could look like.

Major informing perspectives of strategy formation which transgress the formal rational planning mode of strategic management include the learning school. This accepts the weak assumptions upon which the planning school is based and suggests that organizations have to learn their way along and treat strategy formation as an emergent process. Such perspective also incorporates the proposition of nurturing the business toward status of a "learning organization" (Senge, 2002; Denton, 1998; Pedlar et al. 1991). This would facilitate the necessary strategic and organizational learning (Finger and Burgin Brand, 1999).

For Porter (1980), strategy formation derives from careful consideration of the firm's competitive position in the industry structure within which it is striving to develop. Such assessment, following the guiding analytical structures produced by Porter from his ongoing research, provides insight as to which of the generic strategy positions suggested by Porter's work – cost leadership, differentiation or focus – the firm should take up in its marketplace. For Porter strategy formation is thus an analytical process.

Commentators such as Pfeffer (1980) and Pettigrew (1988) draw attention to the political nature of organizations. For them businesses are made up of a number of

groupings of individuals, all with particular areas of self interest. Thus, strategy formation is likely to derive out of a negotiating process whereby differences of opinion and power positions produce conflict and new ideas.

Further perspectives of strategy formation build out of schools of thought which draw attention to the ways in which lead managers put together strategies in their minds. Thus view strategy formation as a cognitive process. Other perspectives continue to propound how businesses will always remain at the whim of the external environment. The external environment is, for them, all powerful and deterministic and thus imposes on the businesses just what strategy form is feasible. For this environmental school, strategy formation is an adaptive process.

2.9.6. Key areas of continued academic and practical debate relating to strategy and strategy formation

Careful consideration of the strategic management literature reveals, on the one hand, the existence of a rich and diverse vein of management knowledge. All of which is capable of making some contribution to management practice and how it might be conducted. But, on the other hand, it is that very richness and diversity which results in a lack of consensus and, indeed confusion for the practicing manager. For example, for Mintzberg, et al. (1998), strategy formation can be thought to represent a beast, or an elephant. Each perspective offered by the various schools of strategic management thought offer a grain of truth or slice of valuable insight and understanding. They provide an arm or a leg or an ear or the tail of the 'strategy formation beast'. But none provide the full integrated story of strategy formation. For Mintzberg et al., there is a need for academic research to work toward provision of that much needed fully integrated picture.

Key questions still requiring further attention (de Wit and Meyer, 1998; Wyer 2004) include the extent to which strategy formation can be approached in terms of strategy as pre-determined development path (is or can strategy be deliberate and planned?); and the extent to which strategy formation has or could have an emergent dimension. Is or should management strategic thinking be based upon logic and rationality, or is strategic thinking creative and generative? Does or should strategy formation and

development build predominantly out of formal analysis or out of intuitive management approaches and judgemental reasoning? And under what circumstances will strategic change within an organization be revolutionary and under what conditions will it have a more evolutionary dimension?

2.9.7. The current gap in small business strategic management knowledge

The work of Wyer (1997; 2001; 2002; 2004) focuses upon enhancing understanding of the nature and form of strategic management and strategy formation and development within growth seeking small businesses.

Wyer (2009) utilising indicative existing insight regarding strategic planning and strategic management in small businesses highlights the current ongoing vacuum in requisite understanding. He points out that over the years several studies have tackled the issue of whether planning improves long term business performance (Bracker and Pearson, 1986; Joyce et al., 1996; Perry 2001). Some research has focused on both planning and control processes with regard to enterprise growth, including Wijewardene et al. (2004) who demonstrate an important contribution of sophistication of those processes. Overall, however, the results of these studies are inconclusive. Some studies do suggest positive correlation between formal planning activity and growth or success in achieving primary objectives (Peel and Bridge, 1998; Schwenk and Shrader, 1993), but there is little evidence of causal relationship. Whilst planning may have some value to small businesses (Gibson and Cassar, 2002), understanding of the nature and form of management processes and activities that facilitate sustained long term development of smaller firms is extremely limited.

Thus, against a back cloth of superficial evidence, one can expect significant differences of opinion between those in favour of nurturing formal small business planning (for example, Stephenson, 2004; Fry and Stoner, 1995) and those against (for example, Mintzberg, 1979).

For Wyer (2009) what is questionable is the extent to which formal, systematic, structured approaches to strategic control of the contemporary operating environment

are compatible with the idiosyncrasies and informalities of small business. And whether attempts at management development should try to 'fit' or 'mould' the conventional tools and language of strategy and strategic management to the small business development context. Before carrying any preconceived terminology and conceptualization into the small business arena, it can be argued that it is first necessary to understand the nature and form of the small business development and change contexts and processes that strategic planning is intended to influence and facilitate. And, in particular, what are the micro-level actions and practices that make up strategic development processes in successful growing SMEs, and who is involved?

2.9.8. Emerging small business strategic learning-oriented understanding of what successful small businesses do in strategic management practice

Recent insight from Wyer's ongoing in depth case study investigation of strategy development processes and strategic management in small businesses has begun to address the current void in understanding (Wyer 1997; 2001; 2002; 2004; 2008; 2009). Key resultant dimensions of understanding show how successful growth oriented small businesses within his studies are following idiosyncratic strategic management approaches, processes and activities to underpin strategic development. These include:

Modes of management that are not based on any formal long term written plan: but the owner managers do have a mental, qualitative framework of future development.

The mental frame work incorporates sound owner manager understanding of: (a) the firm's current core markets/products/processes activities; (b) key elements of the external environment which currently influence this core focal business activity; and (c) a 'preferred end' in terms of direction which the owner manager wants to take the firm, given current understanding of the external environment.

Importantly, the mental framework is not rigid: it is adjusted as relevant change in the form of opportunities or threats are revealed. The owner managers use the mental

framework as frame of reference for consideration and working through of opportunities revealed from close interaction with the external environment. Their learning efforts, in terms of trying to identify and unfold understanding of change activities or forces or issues in their external environment in the context of the firm's core activities, are focused by utilising the mental framework as reference frame to concentrate the learning. The owner managers find that they are unable to undertake comprehensive audit and analysis of the external environment (time, resources, ability and nature of change environment constrain), and instead focus on a 'slice' or 'slices' of the external environment. And interaction with key informants may be intended, opportunistic or accidental.

The strategic learning process is not one of simply picking up facts. Learning and development is not simply a case of picking up facts that are handed out by willing 'fact holders'. It is deep dialogical learning from key external informants, such as suppliers, that feed the strategic development process. And a further deep dialogue continued internally with key internal decision makers to try to make sense of externally-derived insight into change situations.

Thus: the discovery process (or, in conventional strategic management terms, the external audit process) draws upon opinion and expertise from a wide variety of local, national and international sources as base input for a dialogical learning process. Discovery activity also involves study and analysis of key secondary documentation such as trade journals and quality business press.

Crucially, new product and market development was significantly based on a 'trial and error' or experimentation approach: 'as long as it is not too costly we will try it.' It is often open to discussion. Thus, discovery is embedded in dialogue and extended into learning by 'try out' where necessary (i.e.: 'action' facilitating 'discovery' and 'choice' as necessary).

The firm's strategic development paths thus have a significant emergent dimension. In many cases having learned their way into a new market niche or unfolded a new product development. The firms then have the confidence to take this new learned and emerged strategic activity forward in a planned, pre-determined development

path (with 'taking forward' taking place within the mentally held strategic planning framework - which remains open to adjustment in the light of any new learning).

Finally, of key importance, tight short interval control underpins development. Effective short term planning is key over the short-term time horizon daily, weekly, monthly, current operating year. This provides 'confidence foundations' and 'management slack' which allow the owner managers to give focus to the bigger strategic picture of the business and its development.

2.9.9. Implications of Wyer's work for this research study

From the standpoint of this author's own research study, the insight into small business strategic management and strategic development processes revealed by Wyer provides sound foundation and context to inform both focus and approach of this current study. For example, Wyer's insight into the nature and form of small business strategy development processes and strategic management and the integral micro management and learning actions that makes up those processes direct research attention to just how ICT does or could help facilitate those small business management and learning actions.

2.10. Elaboration of the Conceptual Framework Foot-holding the Research

The epistemological bootstrapping process within this chapter (an adaptation of the work of Archer, 1988 and Wyer, 1990) involving analysis and critique of the ICT, small businesses development and strategy literature bases and early stage interface with the world of small business practice has produced a field review. This facilitates the build up of a conceptual framework that will be utilized to inform approach to the empirical component of this research. Effectively, review and analysis of relevant areas of the literature has allowed for the teasing out of key partial frames of guiding insight ('bootstraps') capable of synthesis and integration into a foot holding conceptual framework

The framework, diagrammatically presented in Figure 3 contains interlinking elements which separately and in their total framework form:

- (a) The firming up of the initial outline research aim of the study and the integral study sub-objectives.
- (b) Highlighting of key research issues for investigation.
- (c) Identification of an appropriate research approach to facilitate fulfilling of the research aim and objectives, and the design and development of that methodology.
- (d) Accompanying analytical processes and activities for converting crude data and information insight unfolded by implementation of the case study PAR-based research methodology into 'practical' research findings.

Thus, the literature review within this chapter represents the key component of an epistemological bootstrapping process which anchors and informs this research study.

The following provides explanation with regard to the epistemological bootstrapping process and the produced conceptual frame, its component parts and their interrelatedness.

2.10.1. Component 1: ICT and Small Business Strategic Development

Integral to the strategy literature is insight into what it is felt organizations should or could do with regard to effective strategic management of the highly uncertain external environment in which they strive to develop and grow. There is, however, a clear lack of consensus in this respect with a multitude of schools of strategic management thought prescribing or describing what nature and form strategy formation ought to or does take (Mintzberg, et al. 1998). Within a small business development context, insight is more surface with pockets of key informing insight having practical utility, but still overshadowed by a tendency to rely upon large company oriented strategic management models.

This study draws upon those strands of essentially large company oriented strategic management literature which do have relevance to smaller businesses (including Johnson and Scholes 2004); and those relevant pockets of understanding of small business strategy development (including Gore et al. 1992; Wyer and Barrett 1994),

whilst at the same time recognising the early days and tentative nature of the latter understanding and conceptualisation. In particular, the pivotal role of owner manager strategic learning processes and activities which sit at the fore of the work of Wyer et al., is positioned at the core of this research study. This is intertwined with the predominant emergent strategic development process which seems to unfold from the small business owner manager learning the small firm along its strategic development path. In turn, such a learning oriented conceptualisation of small business strategic development brings emphasis to the roles of other key actors on the boundaries of the small businesses activities. These could be suppliers, agents, distributors, customers and even competitors as major sources of owner manager learning. This highlights the importance of owner manager relationships with such actors.

Sitting at the apex of the conceptual framework, therefore, are the overarching small business activities and processes which make up small firm strategy and strategic development. This represents a key area of focus for this study with regard to enhancing understanding of how ICT can better assist small business in identifying and implementing strategic development opportunities.

2.10.2. Component 2: E Business deployment within the small business

Integral to why small businesses undertake strategy development and unfold strategic direction in the way they do, and to the gaining of understanding of the ways that small business do or could utilize ICT, is understanding of the distinctiveness of small businesses vis-à-vis large companies. Crude assessment of small businesses draws attention quite easily, and expectedly, to their quantitative differences compared to large companies. Thus there is the obvious need when working with or studying small businesses to take into consideration enabling or constraining features relating to potential quantitative characteristics surrounding dealing with fewer customers and/or fewer suppliers as well as the possibility of particular small businesses operating with limited resources. But the small business development literature highlights the key importance of the need to also be aware of possible qualitative differences in small businesses vis-à-vis large companies (for example, the work of Welsh and White, 1984; Curran, 1988; Wyer 1990, 2004; Gibb

throughout the 1980s and 1990s). That, for example, small businesses may have advantages deriving from smallness of operation: such as closeness to customers, lack of large company bureaucracy, or close knit social working unit, which can for instance result in fast responsiveness, flexibility of operation and ease of decision-making. But that many small businesses may effectively constitute a potential unique problem-type whereby owner manager and or size-related characteristics or constraints can impact and restrain the sustainability, development and/or growth of the business.

Moreover, integral to this quantitative and qualitative small business distinctiveness vis-à-vis large companies, is the pivotal role of the owner manager whose characteristics and capabilities are the central driving or hold-back force of the small firm.

An important element therefore, is the owner manager's actual and potential learning abilities. Their willingness and ability to challenge their existing perspectives and worldviews of their business in its external environment is important in this work. Their willingness and ability to learn from others and consider the utility of their perspectives and understanding of given circumstances or situations may reveal insights.

Such contextual understanding of the distinctiveness of small business provides the small business researcher or ICT provider with guiding frames of reference to inform both approach to, and interface with, the small business owner manager. In this regard the potential utility of Personal Construct Theory (PCT) has been revealed and highlighted within the literature review (Kelly, 1955 and adapted for example by Wyer throughout the 1990s and to present day). This can be used by the researcher whilst recognising and accepting need for possible adjustment of his own personal constructs or mental models through which he is building understanding of an owner manager. This understanding of the recognition and acceptance of the owner manager's existing personal constructs creates a starting point with regard to the potential uptake of ICT within his business and its possible areas of usefulness. Through this understanding of the owner manager's existing worldviews the researcher can begin to gain insight into their understanding of ICT. This may identify obstacles that may be restricting the owner manager in shifting or

enhancing his existing personal constructs regarding the potential of ICT applications within his business.

Component two of the conceptual framework gives focus to the need to recognise and address the distinctive managerial and developmental features of small businesses. The use of large firm oriented management techniques may not always be suited to the unique problems faced by the small firm and may exclude the notion that the owner manager has a key influence on the strategic direction of the firm (including guiding insight in this respect from Boone et al. 2000; and Storey, 1997). The owner manager's perception of working practices 'the way we do things around here' may prove important in this study. Brown (2005) suggests that an understanding of the owner manager assists the construction of a more complete picture of small firm e-business development. And in this latter respect can be viewed as the key gatekeeper as to whether or not appropriate elements of ICT are identified and utilized within the business.

With regard to this latter issue of small business ICT uptake, drawing upon existing understanding within the ICT literature highlights the nature and forms of some common constraints. These have been found to be restrictive on wider and deeper utilization of ICT applications in the small firm. Key constraints include lack of owner manager understanding of ICT, his or her ICT abilities and cost of ICT purchase and implementation. These hurdles are restricting many small businesses attempted use of ICT. Ironically this also constrains the build up of understanding both for the owner managers of those businesses and outside researchers as to what enabling and/or constraining effects ICT could have. This is at a strategic development level and on the day-to-day working practices if ICT uptake and implementation were attempted. It is to such initial barriers of small business uptake to which design of approach to this study responds. Component two of the conceptual framework highlights the potential for the 'ICT provider researcher' to design and develop an innovative small business oriented research methodology. In particular, component two highlights the value and potential of a research methodology which accommodates the distinctiveness of the small business. This bypasses initial hurdles to small business ICT uptake and facilitates examination of

small business development processes and learning, and change and decision making processes and activities.

Discussed in detail within the methodology chapter and embedded within the conceptual framework, is a synthesis of understanding of small business development and ICT literature bases which inform the approach to investigation in this study. This is achieved in practice through creation of an E-Business Development Platform (EBDP). This has the capabilities to facilitate key recommendations of Tse and Soufani (2003) and Stone (2004) which build upon the notions of the digital economy presented by Tapscott (1996). The deployment of e-business in this study incorporates the requisite understanding of the small firm in relation to its having limited resources (highlighted by Fillis and Wagner, 2005) and other distinctive features discussed above; and attempts to use the potential advantage of the firm's size (Tse and Soufani, 2003) and understand the unique problem types likely to be found in the participant small firms within the study. The platform contains a rigorous research methodology (again, detailed in the methodology chapter) incorporating elements of Participatory Action Research (PAR). It uses Personal Construct Theory (Kelly, 1955) to help identify owner manager learning and development actions, activities, processes and inactions, as well as frozen perspectives or attitudes, in relation to e-business adoption.

In short, critique, analysis and synthesis of the small business development, ICT and strategic management literature bases have highlighted the potential for a rigorous and innovative research methodology. It utilizes Participatory Action Research that incorporates the researcher as ICT provider who supplies the actual core ICT applications to the participant small firms under study. This facilitates the research by by-passing much initial ICT uptake constraint relating to cost and deficiency of owner manager understanding. It is underpinned by Personal Construct Theory which helps facilitate consideration of both owner manager and researcher perspectives, attitudes and standpoints, and of any hurdles to effective ICT uptake that these may present.

2.10.3. Component 3: Development Context

Embedded within the more recent strategy development literature is the highlighting of how understanding of strategy development processes still remains somewhat of a 'black box'. Recent study, including that of Johnson (2002) and Whittington (2004) points to how strategy processes are in reality made up of day-to-day practices and actions which have strategic significance. Strategy research has yet to delve into this black box of only surface understanding of such activities. This perspective together with the fact that any business is driven by its day-to-day operational activities points to the value of orienting this study to include close examination of the internal development context of the participant small businesses. An important key focus is the development context of e-business within the case studies. This could be in terms of how working practices may be impacted and change through the use of the e-business systems implemented and how the cultural issues raised by Stone (2004) may be overcome. In particular the study will focus upon the day to day use of e-business applications and identification of hurdles to adoption.

In short, then, integral to the above is the potential within the research study to consider how e-business impacts on day-to-day working practices per se (including how e-business may change existing working practices). It also has the potential to determine how ICT does or could assist small business in identifying and implementing strategic development opportunities. These could be either via impact on day-to-day working practices or as a (non-working practices) strategic management tool.

It is anticipated that the use of an EBDP will enable firms to overcome many of the issues with regard to ICT competency and skills gaps highlighted in the current literature base (for example, Smyth and Ibbotson, 2002; Quayle, 2002; DTI 2003; DTI 2004, Dixon et al. 2002) and lack of resources (Thong, 2001). Moreover, it also directs the study toward examination of these issues in relation to the firm's external environment. And thus also as to how the concept of co-evolution (Holland 1995; Kauffman, 1995; Johannison et al., 1994 and McKelvey 1999) may have an influence.

It is also likely that the process of implementation of the PAR methodology will produce key 'barriers to uptake' insight which would, for example, inform future ICT providers with regard to identifying hurdles to ICT adoption at differing Internet States, and thus better enable them to advise a firm on the most appropriate development path. This may in turn have an impact upon the working practices of an ICT provider.

2.10.4. Component 4: ICT Security

Examination of the ICT literature highlights how owner manager feelings of insecurity restrict his or her uptake of e-business. For example, Fillis and Wagner (2006) identified security and privacy worries of owner managers when adopting e-business. To overcome this in their case studies they adopted the recommendations of EURIM that protect a small firm in ICT stasis. Such insight orients this study toward development via the EBDP of a means of securing a small firm in e-business transition. Through consideration of the location of ICT services and securing of systems, a small firm can be unencumbered by ICT technical issues such as the secure management of financial transactions. This enables the study, the researcher and the participant owner manager to focus on the strategic development opportunities e-business can present without undue concerns about e-business security.

The potential exists within the EBDP and integral PAR methodology to select proper location of services, secure the applications utilized, accommodate protection of the participant case firms in transition from one Internet State to another and ensure secure management of financial transactions.

Also integral to the ICT literature is the issue of use and adoption of hubs and networks. Again utilising the EBDP and integral PAR methodology, the researcher acting as an ASP provider via the EBDP, can address the limitations of ASPs (such as those highlighted by Currie, 2003) and examine the use of hubs and networks where the case studies themselves form the focal element in deployment and facilitation.

2.10.5. Component 5: Relationship Strategies and Potentially Achievable Internet States

Finally, the literature highlights the importance of relationship strategies and thus the potential within this study to examine how the participant small firm's relationship strategies may change through the development of e-business and progression through different Internet States. These changes could be relationships within the firm or with customers and other competitor firms. Some relationships may not change and there is therefore a possibility that some strategic development opportunities may be overlooked. The issue is also raised as to what are the most appropriate relationship strategies an ICT provider can have with a small firm at each Internet State. How these relationships evolve may enable learning and development within the firm through the presentation of the opportunity to anchor in knowledge and understanding embedded in emerging relationships with knowledge holders such as suppliers and customers.

The resultant conceptual framework in its totality, and the literature-embedded knowledge, understanding and deficiencies in existing understanding which each component and its sub-parts represents, is used within the following methodology chapter to inform the approach to the remainder of the study.

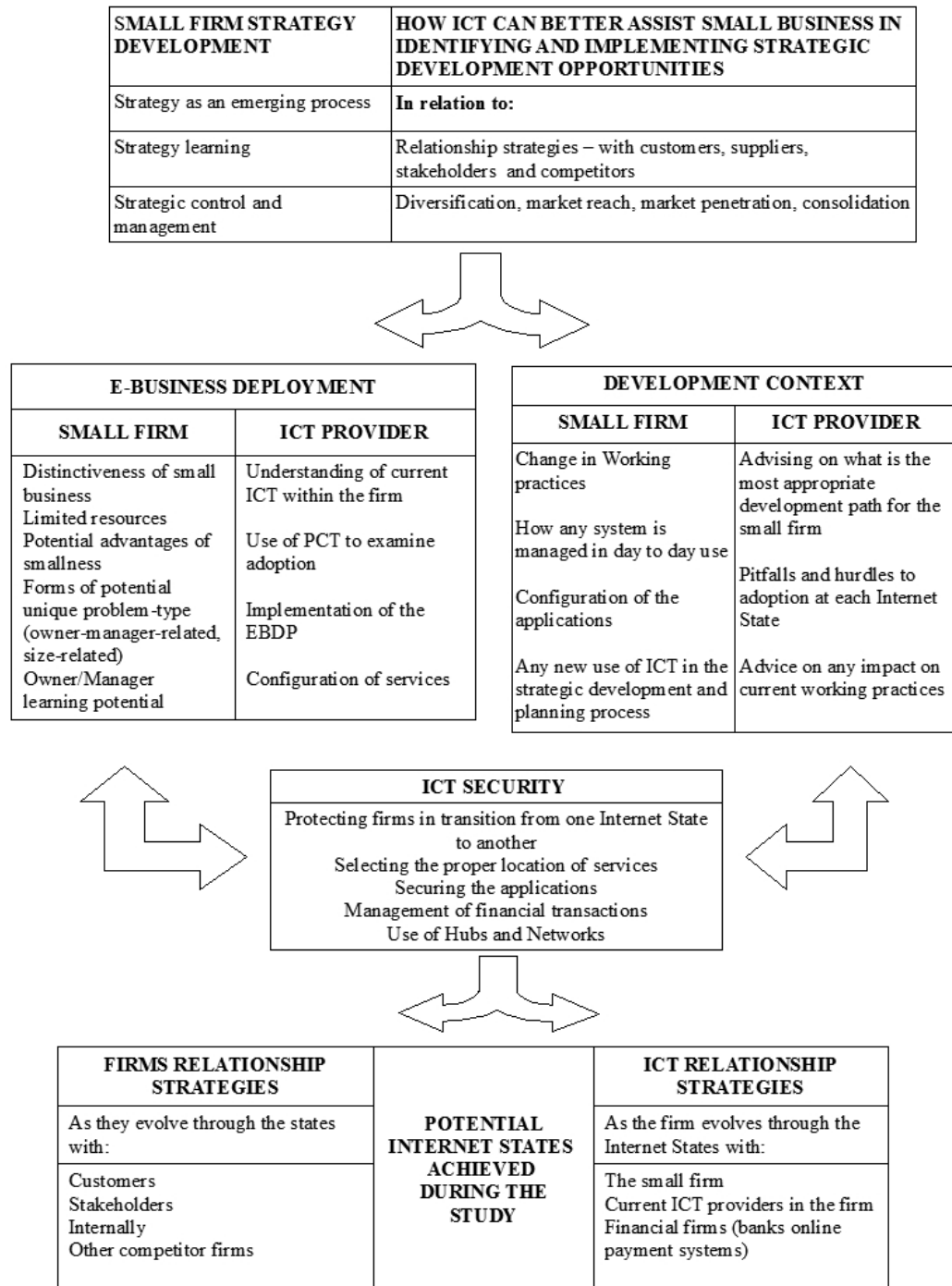


Figure 3 Conceptual Framework Foot-holding the Research

3. Methodology

3.1. Introduction

This chapter commences with overview consideration of traditional perspectives of quantitative and qualitative research methodologies as informing context to a subsequent focus on the innovative action research methodology utilized to facilitate this research. The key role of the epistemological bootstrapping process within the study is discussed and the research objectives are restated as study context. The underpinning compatible philosophical foundations of the research are then established, before giving focus to the innovative nature of the qualitative methodology and its key dimensions; including how the creative methodology in this study involves the offering of ‘facilitating ICT research tools’ which help circumvent key constraints to small business uptake. These are thus first described and explained before a second innovative dimension of the methodology, Participatory Action Research and its specific component parts, are elaborated. The issue of selection of the nature and form of participant case studies is discussed before concluding the chapter with consideration of issues of quality of research process and findings, of the ethical dimensions of the research and of potential underlying limitations of the research.

3.2. Types of Methodologies

Different academic disciplines utilize various methodologies. These methods have often been developed and honed to suit the type of research or investigation being undertaken. Principally there are two main methods which can be used, quantitative and qualitative. Each of these can be applied across a range of disciplines. It can be argued that some studies are more suited to one type than another though this is cause for much debate (Kelle, 2001).

3.2.1. Qualitative

Qualitative research is a broad term that describes research that focuses on how individuals and groups view and understand the world and construct meaning out of

their experiences (Becker, 1996). This type of methodology is traditionally based in the social sciences and is narrative orientated. Qualitative research methods are sometimes used together with quantitative research methods to gain deeper understanding. Qualitative methods focus on the research phenomena in the real world context, that is, within their naturally occurring environment. The qualitative researcher attempts to tease out the meaning the phenomena have for the participants. This is placed within a narrative. The problem is that not all events and human interaction take the form of a story. In general, qualitative research studies rely on three basic data gathering techniques: participant observation, interview, and documentation (Adler & Adler, 1987; DeWalt & DeWalt, 2002).

Strategy	Action
Participant observation	Aims to gain a close and intimate familiarity with a given group of individuals. An intensive involvement with people in their natural environment.
Interview	A research interview is a social interaction between a researcher and a subject who is identified as a potential source of information, in which the interviewer initiates and controls the exchange.
Documentation	The recording of events, interviews and observation. Use of company documents and wider sources of literature (industry journals)

Table 7 Data Gathering Techniques

Qualitative research is gaining in popularity since it began in the 1970s. This may be partially due to the fact that it is better understood by lay people. Practitioners of this type of methodology believe that it is especially well-suited to getting at the subjective qualities of the real world, although this belief is far from universally accepted (Adler, 1987).

3.2.2. Qualitative versus Quantitative

Qualitative research is viewed by some researchers as a contentious methodology (Mehan, 1998). Some researchers refuse to accept it as a research method at all. This is due to them viewing its methods as unstructured or unrepeatable. However, it has gained a wide acceptance and spread across a range of academic disciplines (Giddens, 1990). The nature of qualitative work is based on inductive logic. Inductive logic is the process of reasoning in which the premises of an argument

support the conclusion, but do not ensure it. Clearly this differs from quantitative work due to the fact that conclusions are drawn from statistics only after the events. The argument against quantitative work is the possible failure to encompass other factors that may be present and could result in missing or misinterpreting factors that may be important (Gorman and Meyer, 1994). This criticism can be equally levelled at qualitative work since, whilst obviously an attempt has been made to look at all or many key factors, some may have been overlooked. The concept of qualitative research though looks at the outcomes and the perceptions of those outcomes by the participants involved. This is where qualitative work may hold value. Although the quantitative results may differ from the qualitative research this may well be due to quantitative work not including ethereal values held by the participants involved. This holds particular value in the social sciences where absolutes are not dealt with. In this context we are seeking an understanding of the real world paradigm faced by the participants and how they react within it.

The following sections focus upon the nature and form of research methodology utilized in this study.

3.3. The Research Approach within this Study

3.3.1. Utilising a Version of Epistemological Bootstrapping

The approach to this study is founded upon development of a version of epistemological bootstrapping (Archer, 1988; Wyer, 1990) as a base methodology to foothold a participatory action research (PAR) process.

The rationale for utilisation of an initial epistemological bootstrapping process derives from the need for base epistemological understanding to inform the empirical component of the PAR. Thus, in this regard, recognition of the need to draw upon existing understanding embedded both within the current literature and within the experience base of the researcher.

The literature based understanding of small business development and of owner manager use of ICT to underpin and facilitate that development offers very strong pockets of understanding. However it continues to be interspersed with fragmentation and ad hoc investigation. Some researched insight provides depth of understanding whilst other is based on more superficial perspectives.

In addition, the researcher brings with him depth of experience and frames of understanding with regard to business use of ICT, but there is need for clarification of relevance of such 'world view' within the context of small business development. In particular with regard to the pockets of existing understanding embedded within the current literature. Both the researcher's own 'world view' and insight within the extant literature is value and theory laden: underlying assumptions need to be made explicit.

There is thus the need for a foundation research approach which can provide guiding base insight and thereby foothold the research through the building of partial frames of guiding insight in a co-ordinate integrated fashion (i.e.: a 'bootstrap'). The undertaking of an epistemological bootstrapping process offers such potential by drawing on relevant areas of existing literature and an initial pre-PAR process interface with key external informants (e.g.: small business owner managers; support providers; government agencies). The use of key informants' insight parallel to the literature review provides ongoing practical insight and draws upon key experience input to assist the researcher in his constructive critique of the literature. This epistemological bootstrapping process was undertaken and presented within the previous literature review chapter and provides linkage into this research methodology chapter.

As seen in the previous chapter, the bootstrapping produced partial frames of insight are integrated into a conceptual framework with the latter deriving from critical review of areas of the literature. One or more areas of literature are used as frame(s) of reference for analysing other areas and key informant insight provide frames of reference for analysing the literature. The partial frames of key insight are then teased out and synthesized into the conceptual framework.

The resultant conceptual framework footholds and informs the remainder of this research, and in particular enables:

- Clarifying and firming up of the research aim and objectives.
- Raising of the key research issues requiring investigation.
- Making explicit of any underlying assumptions.
- Determining of appropriate relevant research methodology and methods.
- Elucidating of underlying philosophical foundations of the research (compatible epistemological/ontological combinations).
- Within this study: making explicit of the appropriateness of a PAR based case study approach; and the design and development of facilitating case study instruments and protocols.
- Parallel design development of analytical framework/analytical processes.
- Iteratively consider quality issues and quality processes (e.g.: various triangulation forms and levels).

3.3.2. Clarifying and Firming Up the Aims and Objectives of the Study

Elaboration of the conceptual framework has thus allowed for revisiting of the initial outline aims and objectives of the study and their clarification and firming up as follows:

The overall aim of this study is to:

Examine e-business evolution within small and micro firms and its impact on strategic development and working practices.

The sub-objectives of the study are:

- To consider the extent to which, and how, providing a small firm with ICT provision capable of e-business functionality impacts on the strategic development context of the participant firms.

- To consider the extent to which, and how, providing a small firm with ICT provision capable of e-business functionality impacts on the working practices of the participant firms.
- To determine the ICT security implications of empowering a small and micro firm whilst undergoing ICT development.
- To examine the extent to which, and how, providing a small firm with ICT provision capable of e-business functionality impacts on the relationship strategies of the participant firms.

This firming up process and comprehensive use of the conceptual framework highlights the need for qualitative, rather than quantitative forms of research investigation. This is in order to address examination of dynamic processes relating to small business decision-making, change and learning and development that are embedded within the above aims and objectives. The remainder of this chapter elaborates the research approach of this study. This flows from the base epistemological bootstrapping process and the underlying philosophical foundations of that research approach.

3.3.3. The Philosophical Foundations of the Research

The study utilizes a PAR based case study mode of investigation to small business uptake of ICT and its impacts. In so doing adopts a qualitative processual orientation which raises the issue of epistemological and ontological standpoints of the research. Epistemology relates to the development of knowledge and ontology relating to views of reality.

Wyer (1990) in his adaptation of the epistemological bootstrapping process was led through the complexities and intricacies of compatible epistemological/ontological philosophical standpoints to underpin case study investigation by Archer (1988) and (Thorpe 1998). The use of epistemological bootstrapping within this study is similarly underpinned by the philosophical foundations preferred by Wyer (1990).

Thorpe (1998) suggests there are only two base methodological camps which funnel researchers into one of two philosophical directions, positivist and normativist.

For Thorpe (1988),

Basically there are only two designs that are possible in research and these equate to fishing and trawling for data. The fisherman believes that in order to understand what is in the sea, all that you need to do is to pull out one or two of the fish and examine them. By studying how one fish works, he would have a good approximation of how they all work. It is realised that care has to be taken with taxonomies in the sense of finding the relevant variables, but once you have a type, then studying one or two will, it is thought, give tremendous insight into types of all sorts. The trawler on the other hand prefers to dredge the ocean to pull out as many fish as he can. Assessment of types is done by correlation, comparison and examination of what has been caught in the trawl.

Thorpe uses this analogy to underline the basic differences between positivist (trawler man) and normativist (fisherman) based methodologies. For the trawler man the acceptable epistemological-ontological combination is positivism/external realism. External realism views reality as independent of the researcher studying it, and positivism views the researcher's observations as independent of his/her values and beliefs. Thus it is the independence, if maintained, which provides the rigour of the research. For the fisherman, the acceptable epistemological-ontological combination is normativism-subjective realism, suggesting that for understanding of variables such as behaviour the researcher must get close to the study and analyse in detail. Normativism is based on the possibility of deriving conclusions expressing a value judgement. Importantly it dismisses completely the fact-value distinction. Subjective realism suggests that everyone constructs his/her own view of reality. Proponents of this combination thus advocate a qualitative approach to research based on the notion that rigour requires the close and intimate observation only possible in analysis of small samples at any one time. Such analysis does not permit the independence between researcher and the researched, or between fact and value (Archer, 1988). For Archer (1988) knowledge is viewed as neither value free (positivist), or positioning fact and value as totally indistinguishable (normativism). Moreover, the underlying view of reality rejects the possibility of reality existing independently of our construction of it (external realism) and rejects the notion of each person constructing his/her view of reality (subjective realism). Instead internal realism propounds an inter-subjective view of reality - an inter-subjective

construction of the shared human cognitive apparatus (internal realism). Facts and values are being intertwined and hard to disentangle, not indistinguishable as in normativism. Both fact and value are thus viewed as being involved in scientific knowledge (non-positivism). Such a philosophical standpoint thus offers a bridge for management researchers between the "fisherman" and "trawler man" management research camps.

Within this study it is the compatible philosophical foundations of non-positivism – internal realism which underpin a qualitative research approach. This approach is elaborated in the following sections.

3.3.4. The All Embracing Participatory Action Research based Research Frame of the Study

3.3.4.1. Choice of Qualitative Methodology

As highlighted above, a qualitative methodology has been chosen for this research. This decision was based on several factors. This work needs to consider the notion of co-evolution and the influences and relationships a firm has with others. These could be stakeholders, suppliers, those in the extended enterprise and others. This has been highlighted in the literature by authors such as Holland (1995), Kauffman (1995), Johannison et al., (1994), McKelvey (1999), Tse and Soufani (2003), Fuller (2003) and Wyer (2003). Arbore and Ordanini (2003) also suggest that considering small and micro firms as a whole could cause problems, as it could hide internal variances. A qualitative approach may provide a deeper insight as we are not researching small and micro firms, as they put it as a “monolithic reality”. Keely (1998) points out that relationships are everything in the new economy. Lockett and Brown (2006) and others place great importance on clusters and networks in the new digital economy. These clusters and networks could encompass new forms of relationship strategies and reach outside of the sphere of the firm, thus a qualitative method holds more value as it may encompass factors not considered at the onset of the study.

Ramsey et al. (2003) suggest that the impact of the new ICT technologies that enable e-business can have a fundamental effect on the business as a whole. The diversity of each firm as pointed out by Arbore and Ordanini (2006), and the fact that e-business

technologies reach outside of the traditional boundaries of a firm coupled with the notions of co-evolution and participation in clusters and networks, make quantitative study difficult. There are also issues of fully understanding the development context within small firms which can vary greatly.

By way of a 'toe-in-the water' approach to considering what may be an appropriate research approach for this study, at the outset of the research an online survey was created to examine Internet use and ICT business processes. This survey was undertaken in conjunction with literature review insight to gain an understanding of these issues. However the results proved inconclusive and unhelpful. This was due to several factors. The survey results were not analyzed in detail as, following the initial review and examination, it was felt little would be gained from doing this. The results were similar to other surveys conducted (DTI 2003, 2004). The statistical analysis of the firms and ICT did not provide new insight, but only confirmed other studies. Surveys have shown (Dixon, 2002) that very few firms use ICT in a strategic or development context and did not include ICT in their planning. Wyer (2003) suggests that there is a lack of understanding of the strategic development processes and the development context in small and micro firms. This lack of understanding spans the range of academia, government and practitioner bodies. It is this lack of understanding of the strategic development context that was being reflected in the questions asked in the surveys including the one used for this work. This was coupled with what could be described as loaded questions where the participant answers as he feels he or she is expected to. An example of this is if one asks an owner manager a question he or she may answer as they feel the questioner would want, they do not want to lose face or it is what they feel is expected of them. It may be possible to restructure the gathering of statistical data to encompass these issues and enable a deeper understanding. However it was decided that a survey would not give the detailed processual insight needed for this work. A qualitative approach gives the opportunity and flexibility to allow for other variables to be discovered *during* the research process, not least the rich detail of processes and the *context* within which those processes unfold.

The works of Wyer (2004), Fuller (2000) Boone (2001), Fillis and Wagner (2006), Shaw (2006), Arbore and Ordanini (2006) and others have shown the need to

understand the contextual frame of operation of a small firm, incorporating internal context and external environment. This frame of reference may encompass the influences of suppliers, the extended enterprise and other non mainstream sources. These sources may not even be a valid source in terms of the expertise offered but the information or advice received may be followed by the owner manager. This makes it difficult to understand a small firm without considering the contextual environment. The issue of a need for understanding of *how* process unfolds, and the contexts through which that unfolding takes place, provides a key element of the rationale for a qualitative approach to effectively undertake this research.

At this stage of the research it was decided that a series of interview based case studies would be carried out to investigate these issues further. The interviews also proved inconclusive as no real understanding was gained of the issues faced. Interviews are frequently conducted in an artificial environment often away from the work place. This alienation was felt to be a stumbling block in gaining insight into the contextual environment. The problem was also faced of observing a step change, if any, in the working practices and development processes of the firms studied. This onset of a step change in working practices could be considered to be a critical incident (Chell, 1998). Chell proffers the critical incident technique as a qualitative procedure which facilitates the investigation of significant occurrences. These could be events or incidents. Chell states that the objective is to gain an understanding of the incident from the perspective of the individual, in this case the owner manager of the small firm.

The critical incident can occur at any time and may not be related to what an observer may expect. An observer may feel that a certain incident could prove to be important and this may have no relevance to the observed. This is particularly true when we have uncertain or undefined frames of reference and the deployment of ICT within a small firm may create this. To address this issue an in depth investigative approach to the case studies is more appropriate, as this places a greater emphasis on the contextual frame of reference within the studies. This can give focus to change processes, learning processes, and decision making processes. This would allow for revealing of and giving focus to variables that may not have been considered at the onset of the studies. Such a chosen methodology allows for interviews, surveys and

examination of documentation to be encompassed. The building of any surveys and interviews undertaken out of the bootstrapping process of the methodology gives an added depth to the work which may bolster the researcher's insight. This allows the research process to gain from these techniques and then use any findings as a backdrop to processual, ongoing, investigative research.

In the potential participant case studies within this ICT oriented small business research, financial considerations were an issue. Some firms may well be willing to adopt or try new ideas or technology but monetary constraints mean that, although desirable, they can not be implemented. In a corporate environment such restrictions may not apply. The research project was left with the issue of identifying willing small firms but who had no resources to try out technologies which would form the focus of the study because of their lack of understanding of implementation and operation. There was also no immediate financial gain seen by the firms. The question then was how to conduct this work if possible participants firms were not exposed to the potential of the new technology. To overcome this restraint it was decided that the qualitative research design would involve the researcher becoming an "expert participant" and provide the technology, training and expertise required for the firm to adopt these technologies. The firms were empowered to initiate this work through elements of Participatory Action Research (PAR) which would be approached, assessed and presented in a case study mode of research investigation. The following sections elaborate this adopted methodology further.

3.3.4.2. Participatory Action Research

Participatory Action Research (PAR) has its roots in action research first developed by Kurt Lewin in the 1970's. It has at its core an understanding of three sets of relationships:

a) Relations between individuals, communities and groups

This deals with how individuals interact within their community and how they subsequently act when belonging to a group which may be a part of the larger community.

b) Relations between those communities and groups

Groups may have different behaviour to individuals when interacting with the wider community.

c) Relations between people and their physical environment

This considers how environmental factors play a part in relationships. The physical environment may be affected by economic factors or the provision of other facilities. Good or poor communication infrastructures are an example.

This type of methodology fits well with Fuller and Paul's (2000) concept of co-evolution and firms relationship strategies. It allows for the concept of co-evolution by encompassing the wider relationships that a firm may have with other bodies. It has a bearing on relationship strategies as it examines relationships in several contexts. The context of these relationships may provide insight into ICT adoption in the participant firms.

Participatory Action Research is a methodology of intervention, development and change (Wadsworth, 1998). The researcher within this study is an expert participant in providing the technology required, therefore it is important that this role be identified and understood and is explained at the outset of the studies in Chapter 4. The role reaches beyond the provision of the technology and impacts on the relationships, development and group dynamics within and surrounding the participant small businesses. Participatory Action Research also challenges the traditional model of a teacher and student.

Traditionally a teacher stands in front of a class and imparts knowledge to a student. In Participatory Action Research there are no passive recipients of knowledge. For Wadsworth:

Essentially Participatory Action Research (PAR) is research which involves all relevant parties in actively examining together current action (which they experience as problematic) in order to change and improve it. They do this by critically reflecting on the historical, political, cultural, economic, geographic and other contexts which make sense of it.

Participatory Action Research is not just research which we hope will be

followed by action! It is action which is researched, changed and re-researched, within the research process by participants. Nor is it simply an exotic variant of consultation. Instead, it aims to be active co-research, by and for those to be helped. Nor can it be used by one group of people to get another group of people to do what is thought best for them - whether that is to implement a central policy or an organizational or service change. Instead it tries to be a genuinely democratic or non-coercive process whereby those to be helped, determine the purposes and outcomes of their own inquiry. Wadsworth (1998).

Wadsworth's explanation of Participatory Action Research demonstrates co-evolution. No one party is a leader in the research but work in a democratic process to solve problems and issues. He further emphasizes that Participatory Action Research is an evolving process. It works on a cyclical basis and raises questions and issues as the research is being conducted. This makes it a very fluid methodology that allows all the participants to input into and help shape the dynamics of the research.

Participatory Action Research proceeds through repeated cycles, in which researchers and the community, or in this case firms, owner managers and their co-decision makers progress to solve a problem. It starts with the identification of major issues, concerns and problems. These key actors initiate research, originate action, learn about this action and proceed to a new research and action cycle. This process is a continuous one. Participants in action research projects continuously reflect on their learning from the actions and proceed to initiate new actions on the spot. Outcomes are very difficult to predict from the outset, challenges are sizeable and achievements depend to a very large extent on a researcher's commitment, creativity and imagination. Participatory Action Research is often used in low income communities and in adult education.

3.2.4.3 The Participatory Action Research Cycle

Conventional research methodologies run in a straight line from A to B. In Figure 4 we see that Wadsworth questions the basis of the hypothesis and challenges the

researcher to demonstrate the conclusions in practice. Without this challenge of application the results form academic solutions, yet to be tried. Small firms are not prone to accept academic ideas without evidence of success or likely to try “blue sky” ideas without some evidence. Fuller (2002) shows this in his work on co-evolution of new business practices and ICT adoption in firms. Using Participatory Action Research there is a more cyclical model of research: questions and issues are raised and challenged. The research attempts to address these and may carry on from that point. In other words the research flows in a cyclical manner shown in Figure 5.

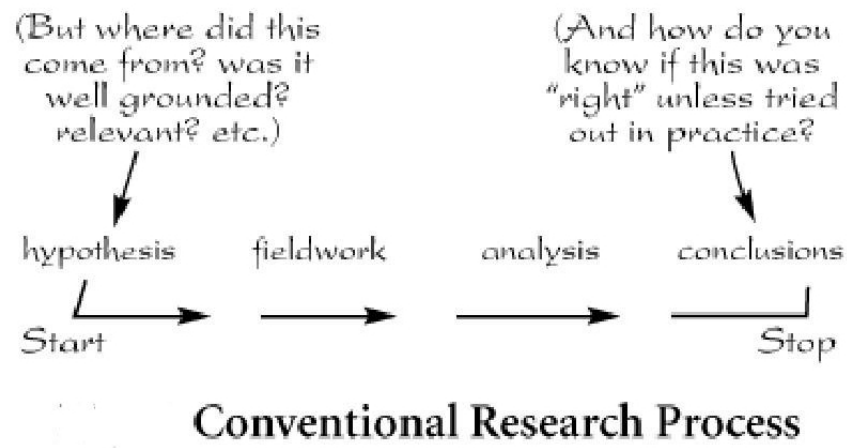


Figure 4 Conventional Research Process (Wadsworth, 1998)

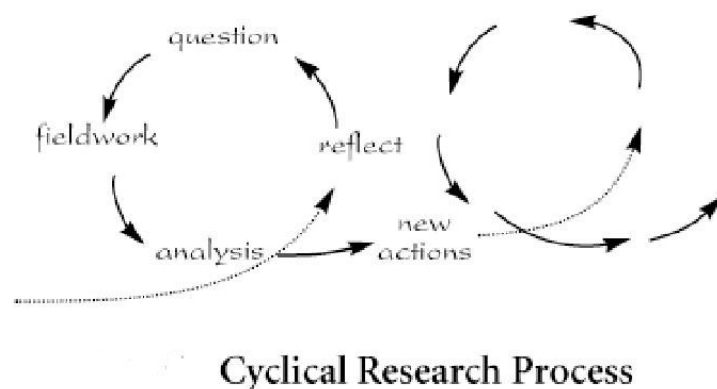


Figure 5 Cyclical Research Process

It can be argued that many methodologies follow this logic. Participatory Action Research differs in the sense that it attempts to understand this process and include this in the research cycle. Participatory Action Research or action researchers are those that attempt to understand their actions within the context of the relationships and fieldwork environment. Participatory Action Research attempts to understand and to compensate for the following:

- The effects of raising some questions and not others.
- The effects of involving some people in the process (or even apparently only one) and not others.
- The effects of observing some phenomena and not others.
- The effects of making this sense of it and not alternative senses; and
- The effects of deciding to take this action (or 'no' action) as a result of it rather than any other action and so on.

Participatory Action Research has been adopted and used in the field of managerial research. Shankar (2001) faced similar problems and issues to those in this work in researching managerial learning. He also felt that traditional research methods did not seem appropriate when dealing with managers in their natural setting.

“The constraints I faced in my research situation were:

- I had to use a small sample of engineering managers within my operation for the study.
- It was difficult to isolate the sample in a controlled setting, as we could not afford to take the managers away from their work environment due to our workload.
- I had to actively participate in the processes and could not stay away from the managers while the research was being conducted as it was carried out concurrently with their normal work.
- It was difficult to set up measures to check the learning of the managers, and conclusions could only be made about this indirectly”.

These issues and problems are very similar to those faced in this research. Shankar does not state if the firm is a small or micro business but the constraints due to time

and resources placed on the research suggest that this may be possible. Importantly, his final model included external influences of the researcher. Shankar felt that these influences had an impact on the research and the researcher and these were considered important additions to the research cycle. It is not important to question if these external influences were relevant in terms of expertise, just that they occurred. Wyer and Barrett's (2003) notion of a contextual frame of reference for examining the learning process and strategic development activities of an owner manager of a firm also concur that such frames of reference are important.

In evaluating the methodology Shankar emphasises that it is important that at least two cycles of the research process need to occur. He also felt that a number of case studies need to be provided to give the required depth for a doctoral standard. A similar number of studies and cycles have been used in this work.

3.3.4.3. Risks of Participatory Action Research

All methodologies have advantages and disadvantages. Ellis and Keily (2000) suggest that all action strategies entail risk. Participatory Action Research relies heavily upon the enthusiasm of the researcher in terms of commitment and drive. Participatory Action Research is also known to have a tendency to not fully develop the early aspects of the research epistemological process (the acquisition of knowledge) (Wadsworth, 1998). This has been addressed by anchoring the Participatory Action Research process within Wyer's methodology which provides a solid contextually based epistemological bootstrapping process.

Ellis and Keily also state:

“All action inquiry strategies entail risk. An assessment of the risk inherent in particular approaches will also influence choices. Through reflective action, managers become more sensitive to the social realities of the business organization in which they are working. They become aware of what the dominant culture of the organization is prepared and ready to accept. Certain ideologies or procedures may not be acceptable or endorsed at a particular moment in time. These considerations influence the assessment of 'fitness for purpose' of action inquiry

strategies” (Ellis and Keily, 2000).

This emphasizes the need to be aware of the potential of and the limitations of the empowerment procedure. This empowerment may impact into areas outside of the field of research and may not be viewed positively outside of the researcher’s sphere of participation. In particular, Ellis and Keily (2000) caution that Participatory Action Research impacts on the individual as well as the business.

“Participatory Action Research, with its emphasis on the liberation and empowerment of individuals by enhanced awareness of existing social conditions, opens up the potential for transformational change. As such it has considerable risk for individuals and the business organization in which they work. Power rests with co-researchers in the inquiry process. Those working in business organizations may find difficulty in truly enabling others to empower themselves and work towards a mutually preferred future state. Within the managerial and organizational domain, there are different views concerning who should benefit from the solving of participatory work based problems (Park, 1999; Wadsworth, 1998; Weil, 1998; Winter, 1996)”.

Here Ellis and Keily hold a joint view with other academics. It is not known if the business organizations discussed in their research are small firms or not. If they are large organizations then the dynamics of small firms may be different and almost certainly are. However the cautionary note about impacting on the group dynamics of a firm that may not be spread throughout the company still holds true. This empowerment may not be desired by the individuals within the firm for various reasons. In conclusion, Ellis and Keily do favour action research strategies. They feel they can be a useful tool in tackling real world problems for businesses. Perhaps more importantly, they conclude that the nature of the research process equips the participants for dealing with future problems.

3.4. Key Research Design Issues Relating to Effective Utilisation of PAR within this Study

The undertaking of a PAR based research approach which orients around the uptake of ICT within small businesses requires the anticipation and facilitation of key obstacles which may constrain such research. These include issues surrounding possible cost constraints and affordability. These impact many small firms and may be coupled with potential difficulties relating to owner manager ICT capabilities and learning and development. This section considers and explains innovative and creative dimensions of the research approach which have been designed and developed to address and accommodate such possible constraints and facilitate an effective PAR process.

3.4.1. Facilitating ICT Research Tools Underpinning the Study

3.4.1.1. Researcher as Application Service Provider

Integral to this research study is a unique ‘study facilitating’ role taken up by the researcher which sits within and enables the all embracing PAR-based research methodology. These are designed to circumvent key constraints which traditionally impact upon small business uptake and use of ICT and thus of its study. This facilitating role in part utilizes ‘facilitating ICT research tools’ and it is to these research tools that this sub-section turns before focusing upon the specific details of the all-embracing innovative PAR methodology which drives this research study in its totality.

ICT used for inter and intra business processes require several key components to be in place to facilitate its use. These are:

- A strategic network architecture
- An Internet connection
- A server with the required hardware capabilities
- An operating system on the server that is capable of collating and managing requests from the internal and external network
- An RDMS (relational database management system)
- A series of protocols and computer languages capable of processing the requests made to the operating system. Examples of these protocols are SSH, FTP, and RSYNC. Examples of the computer languages required are SQL, HTML, and PHP
- An operating system capable of managing user's levels in the system in order to establish an effective hierarchy for management and control of users and processes
- An effective set of security protocols to enable the safe and secure transfer and management of data

These processes and infrastructure once in place allow the owner to participate in hosting and control of B2B (business to business) and B2C (business to customer) applications. This can be seen in Figure 6.

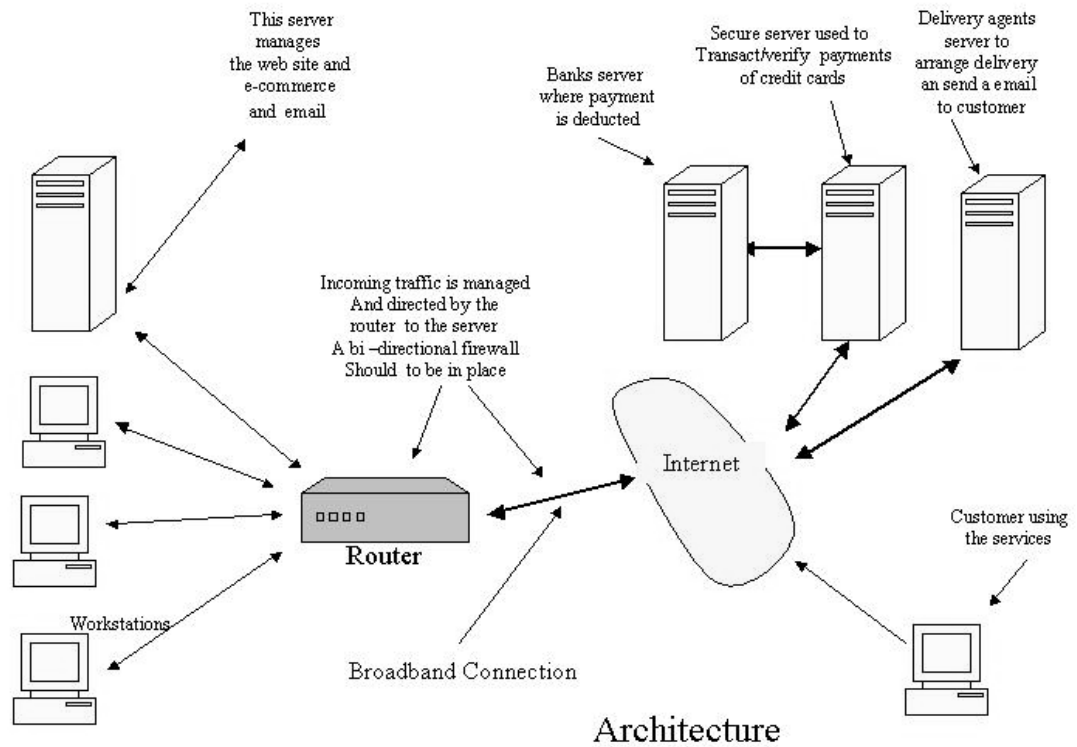


Figure 6 ICT used for inter and intra business processes

Figure 6 represents an architecture and system that enables a company to perform e-business. It requires a sophisticated server and this is managed along with the firewall and router within the company. This requires specialist knowledge and skill on several levels and this may not be available to firms without consultancy or employing specialist ICT staff. This may prove expensive. There is a potential security risk and loss of service if these systems are not managed correctly. These systems may be viewed as too complex without specialist staff. This is the situation with the case studies in this work. To overcome this problem the researcher became an Application Service Provider providing the services needed. This architecture is detailed in Figure 7.

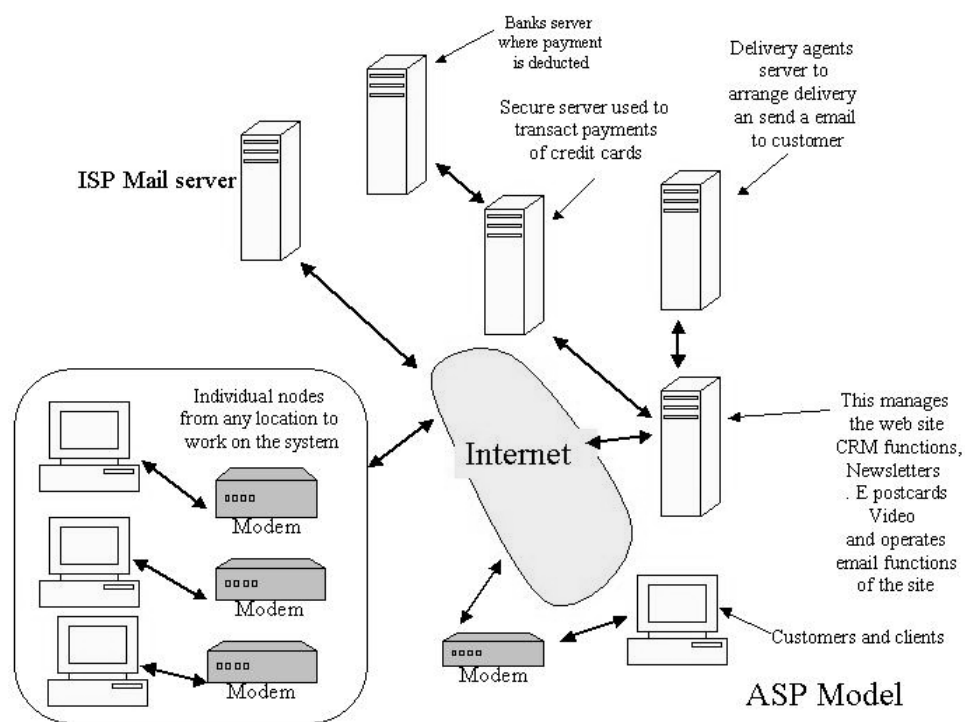


Figure 7 Application Service Provider ICT Model

Application Service Provider services are web and internet based applications that provide a possible way of integrating current ICT provision in the small and micro business with the more sophisticated ICT required for business to business (B2B), business to customer (B2C) and e-business processes. This will enable matters of security and ICT sophistication to be overcome and allow the firms to trial new e-business processes without incurring an excessive financial penalty. We can in Figure 7 see that using this model a firm engaging in e-business does not have a server. It is hosted and managed by the Application Service Provider. The firm does not even possess an internal network structure. The entire system is managed via any workstation that is connected to the Internet. The advanced management of security and installation of applications is managed via the Application Service Provider leaving the company to configure and manage the services as they see fit. This solution is ideal for the case studies in this research as none possess any knowledge of server based ICT. This architecture is used within the case studies.

3.4.1.2. Application Service Provider ICT Architecture and Security

This Application Service Provider ICT architecture is common to all completed studies. The ICT security was configured by the researcher acting as an Application Service Provider. This shift in the location of services allows for greater, more flexible access and for a more dynamic system. This allows the firm a far greater degree of control over the output of the systems due to the more complex functionality of the ICT.

Service	Port	Case studies
Web	80	ASP
Ssh	22	ASP
email smtp	25	internal out only
email pop	110	link to ASP
ftp	21	link to ASP
Sftp	115	link to ASP
Files	21/80	Local and ASP
Databases	80	Local and ASP

Table 8 ICT Service Control and Location used in case studies

In the studies many of the security considerations are now managed by the researcher acting as an Application Service Provider. Table 9 demonstrates the shift in ICT functions from the local workstation to the Internet. Electronic files are now accessed on the web via port 80 and port 21 (ftp). All the case studies implemented the general security considerations recommended in the literature review, in terms of anti virus software, password management and keeping the workstation operating systems up to date with the latest patches. In evolving towards higher Internet States many of the security considerations of the systems will now be managed by the researcher due to the shift in location of the services. Service provision has migrated and the e-business provider manages the security of the systems located on the Internet.

3.4.1.3. Applications Used in the Study

Two main applications are used for this work and provided by the researcher as 'facilitating ICT research tools'. These applications were hosted on the Application Service Providers server. The applications utilized were a content management system (CMS) and a virtual learning environment (VLE). This is in conjunction with email facilities.

Content Management System (CMS)

A Content Management System (CMS) is a computer software system used to assist its users in the process of content management. It facilitates the organization, control, and publication of a large body of documents and other content, such as images and multimedia resources. A Content Management System often facilitates the collaborative creation of documents. A web Content Management System is a Content Management System with additional features to ease the tasks required to publish web content to Web sites.

Web Content Management Systems are often used for storing, controlling, versioning, and publishing industry-specific documentation such as news articles, operator's manuals, technical manuals, sales guides, and marketing brochures. A Content Management System may support the following features:

- Import and creation of documents and multimedia material.

- Identification of all key users and their content management roles.
- The ability to assign roles and responsibilities to different content categories or types.
- Definition of the content work flow tasks, often coupled with event messaging so that content managers are alerted to changes in content.
- The ability to track and manage multiple versions of a single instance of content.
- The ability to publish the content to a repository to support access to the content. Increasingly, the repository is an inherent part of the system, and incorporates enterprise search and retrieval.

Some Content Management Systems allow the textual aspect of content to be separated to some extent from formatting. For example, the Content Management System may automatically set default colour, fonts, or layout.

The Content Management System used in this work is an open source application called Joomla. The Joomla web site details its functionality through the use of the extensions or plug-ins that can be added to the core system.

Examples of the hundreds of available extensions include:

Dynamic form builders, Business or organizational directories, Document management image and multimedia galleries, E-commerce and shopping cart engines, Forums and chat software Calendars, Blogging software, Directory services, Email newsletters, Data collection and reporting tools, Banner advertising systems, Subscription services.

(<http://www.joomla.org/content/view/12/26/>).

The core systems were installed in all the studies within the research where a Content Management System was used with plug-ins being added when required.

A Virtual Learning Environment

A Virtual Learning Environment (VLE) is a key ICT application used in the Germany based case study within this work and is an open source application called Moodle.

A VLE can be defined as:

A software system designed to facilitate teachers in the management of educational courses for their students, especially by helping teachers and learners with course administration. The system can often track the learners' progress, which can be monitored by both teachers and learners. While often thought of as primarily tools for distance education, they are most often used to supplement the face-to-face classroom. These systems usually run on servers, to serve the course to students as Internet pages. Components of these systems usually include templates for content pages, discussion forums, chat, quizzes and exercises such as multiple-choice, true/false and one-word-answer. Teachers fill in these templates and then release them for learners to use. New features in these systems include blogs and RSS. Services generally provided include access control, provision of e-learning content, communication tools, and administration of the user groups.

(http://en.wikipedia.org/wiki/Virtual_learning_environment)

3.4.1.4. The E-Business Development Platform

The combination of Participatory Action Research and potential ICT development in relation to e-business in small firms and the associated addressing and accommodation of potential constraints with regard to this combination process is a unique element of this work. A specific dimension of this uniqueness is the capturing of the dynamic and human processes of ICT uptake within the small business through design and elaboration of an E-Business Development Platform (EBDP). The EBDP incorporates the recommendations of Tse and Soufani (2003) and Stone (2004) which build upon the notions of the digital economy by Tapscott (1996). The EBDP is capable of facilitating virtualisation, disintermediation and molecularisation. Importantly, consideration is given to the small firm having limited resources (Fillis and Wagner, 2005). It is an agile and flexible platform that is capable of utilising the

potential advantage of the firm's size (Tse and Soufani, 2003). It also attempts to compensate for the unique problem types found in the small firm (Curran 1988, Carson, 1991).

Thus, the EBDP creates a dynamic and fluid research path in which events and or actions can be built or acted upon *during* the research process. Therefore the commitment of the researcher is an important factor. Importantly it examines the development context and processes of the participant firms. This is achieved by the researcher and the owner manager working closely together to gain the desired results as set out by the owner manager through discussion. In Figure 8 we can see how the ICT discussed earlier (Figure 7) in this work is combined with the Participatory Action Research methodology to create an e-business development platform.

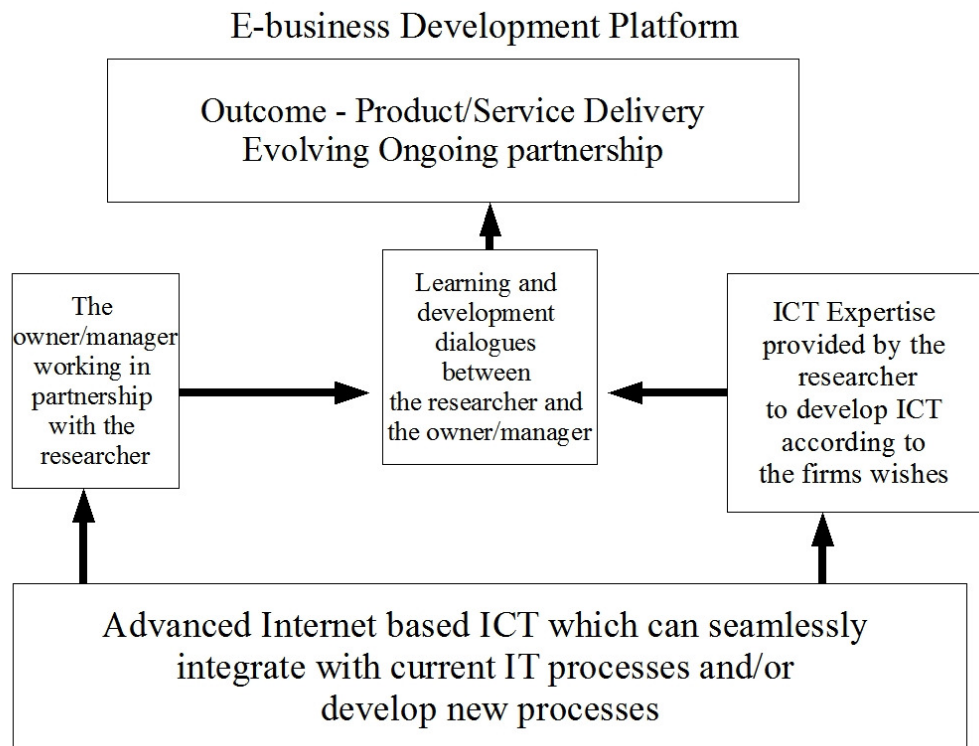


Figure 8 E-business Development Platform

The Internet based ICT provides the base for the research. As discussed above, this is supplied by the researcher as part of the research tools. By simply providing the ICT this may not engage the learning process and thus reveal the contextual and processual development of the participant firms and owner managers. The Participatory Action Research elements of the work are utilized by the researcher engaging with the owner manager through learning and development dialogues. This is part facilitated by use of the premises of Personal Construct Theory (Kelly, 1955) which is discussed and developed in the next section. These action research work elements allow for the owner managers to become involved in the work and feel they are active participants. It is intended that experiencing, analyzing and recording these events/dialogues/actions will lead to a better understanding of e-business development in small firms. Using this methodology the study encompasses a qualitative approach that fully engages with the participant firms and owner managers. The outcomes are unpredictable. Although some quantitative measures are used (a shift in working practices or a move in Internet States) the work relies heavily on qualitative techniques to achieve its aims. A quantitative methodological approach would be difficult to implement due to the large number of variables within the research. For example, it is not possible to fully determine the attitudes of the owner manager to e-business development prior to the work commencing. If their attitude changes as the studies progress so may the outcomes of the research. This work is examining the development contexts of the participant firms and thus the final outcome is only part of the picture. How the participant owner managers reached their goal (if any) is just as important. Developments may occur during any possible evolution of e-business and thus perceptions of the owner managers or the small firm may evolve *during* the research process. Therefore if the firm's owner managers migrate to more complex e-business provision their perception of e-business may also alter in light of this. This may have an impact on how the firm and owner manager operate in a strategic development context and in wider areas which are difficult to predict.

3.4.1.5. Addressing the Issue of Building Insight of, and Enhancing, Owner Manager Understanding and Perceptions of ICT

The personal constructs of the researcher, his perspectives and perceptions and the mental frames of reference he uses to interpret his world and changes to that world and its parts, are an important consideration when conducting this research. This view is similar to Shankar's and the general Participatory Action Research view is that the external influences of the researcher have a bearing on the work conducted (Wadsworth, 1998). Wyer's approach to case study methodology (which builds out of his base epistemological bootstrapping process) coupling both the wider external environment and consideration of the key informant inputs makes for a rich picture of a firm and its development context. The inclusion of these contextual and key informant factors and the way he uses Personal Construct Theory to enhance understanding of owner managers in the small business development context marries well with the nature of Participatory Action Research.

One of the criticisms of Participatory Action Research is a tendency to skip lightly over the epistemological bootstrapping process (Wadsworth, 1998). Wyer's consideration of and emphasis on epistemological bootstrapping and his underpinning use of Personal Construct Theory (PCT) provides a solid foundation for the methodology within this study to develop and create awareness in the researcher of the small firm as a whole. This awareness may have an impact on the research itself and may well influence the development of the firms studied through the changes and developing attitudes of the researcher and the ways in which he gains understanding and progresses the personal constructs of the owner manager.

To aid the analytical process within the participant case studies in this work a Personal Construct Theory framework has been developed. This provides a set of investigative actions to help facilitate examination of the personal constructs of the owner managers. This is in relation to ICT and e-business development and how the owner manager's personal constructs may be impacting on his or her ICT uptake and utilization. This assists the researcher in reflecting on his own personal constructs in his interface with the owner managers.

Whilst designed and developed as a potential step process Personal Construct Theory based analytical framework as follows: The framework will in practice be utilized as a 'flexible frame of reference' that will be used as an embedded element of the PAR process. This is perceived as likely to unfold as a kind of 'crafting process' responding to the nature, form and needs of the 'partnership working' driven (researcher and owner manager) research process.

1. Gain understanding of owner managers existing personal constructs

- How does he view his business and direction of development of the business (to which he currently aspires)
- How does he view ICT in the context of what it can do for his business
- Use close discussion and dialogue with owner manager to 'get inside his story' and empathize with him
- Explore his 'business world' through his own personal constructs
- Integral to the above, help the owner manager to surface and understand the assumptions upon which his existing personal constructs are based

2. Conduct learning and development conversations which provide additional and alternative worldviews for the owner manager of the ways ICT can help his business

- Use, as starting point, owner manager existing personal constructs re understanding of ICT and what he perceives ICT applications can do to help his business.
- Use the researchers knowledge and understanding (worldviews) of ICT (being careful to dilute terminology to owner manager understandable language) as frames of reference which the owner manager can 'try on for size' (and thus begin to address deficiencies in his current understanding/current existing personal constructs)
- Integral to the above, help the owner manager reflect upon, and where necessary challenge, the assumptions upon which his personal constructs are based.
- And help the owner manager work out the implications of the alternative worldviews being suggested or offered by the researcher for his own existing personal constructs

3. Give the owner manager time to absorb the interactions to date. And then follow up the learning and development sessions

- Use follow-up learning and development conversations with the owner manager to reassess, by way of an evaluation or judgment, the level of understanding now held by the owner manager as to the potential of ICT applications in underpinning development of his business
- Identify explicitly areas of sound owner manager understanding and areas of deficiency in understanding – including the apparent underlying causes of those deficiencies
- Attempt to address any existing deficiencies in owner manager understanding through further dialogue/learning and development conversations

- Researcher to also reconsider his own personal constructs in the light of the learning and development discussions – there may be need to adjust researcher constructs in the light of owner manager's personal and/or business development needs

4. Agree initial base ICT implementation activity to be conducted by the researcher

- Undertake ICT implementation
- Effectively, use this as action research in the form of business development activity whereby the ICT implementation offers itself in the form of 'experiment' or 'try out' for the owner manager whereby he can test his personal constructs which have evolved/adjusted to date; and integral to this the alternative worldviews which he is 'trying on' in making adjustments to his existing personal constructs (where his existing understanding is proved to be accurate/appropriate by the implementation phase his constructs will be validated; where misunderstanding/deficiency in his personal constructs are highlighted by the implementation activity, then he makes appropriate adjustment to his personal constructs).

5. Throughout the above PAR processes (i.e. throughout each stage of 1-4 processes above)

- Identify the nature, form and sources of constraints to required owner manager understanding of ICT and its potential for underpinning effective development of his business. Put another way, identify constraints which have or continue to impact on adjustment to, or replacement of, deficient or inadequate owner manager personal constructs regarding understanding of ICT and its potential for underpinning effective development of his business. Thus:
- Have or do 'fixed owner manager attitudes' exist?
- Have or do 'frozen meanings' exist in the mind of the owner manager?
- And/or are there situations where personal constructs have been adjusted by an owner manager, but adjustment has been restricted or limited?

Wyer's case study methodology and underpinning PCT usage is designed for the study of the understanding of the strategic development, management and learning processes in small firms. Whilst this is of value to this work, strategic development is not the only focus of the study. Using Personal Construct Theory in the above analytical form, the analytical framework moves beyond strategic development and attempts to identify constraints and hurdles and facilitating dimensions to ICT adoption by examination of the personal constructs of the owner manager. This is achieved by attempting to encompass and understand the development context of the firm via the owner manager's understanding and perspectives which is known to be a crucial element in the development context of the small firm.

Within this study, the researcher draws upon the broad guiding parameters of PCT. Accepting how we as individuals all develop our personal constructs of elements of our lives and world which we have built up from our experiences to date. We use these personal constructs (personal theories) to inform our future behaviour. Thus, attempting understanding owner manager existing personal constructs of ICT and its potential for his business, what may be 'freezing' a personal construct or restricting its extension or enhancement is key to the PAR approach to research.

Critical to this research approach is researcher recognition that he is not a qualified psychologist and is thus not approaching this research task through some attempted 'formal scientific' application of PCT. Rather, the approach is that of 'educated layman' use of PCT in order to attempt to build 'approximate insight' into owner manager personal construct views of ICT and how that might be limited, blocked or frozen; and how owner manager personal constructs might be enhanced. Such an approach fills a void in traditional conventional ICT provider support to small businesses which allocate little time or resource to determining owner manager starting point of ICT understanding, perspectives and fears or concerns.

3.5. Minimising the Potential for Confusing Personal Constructs of Author and Research Subject

Integral to the above Personal Construct Theory analytical framework is the build-in of researcher actions and processes to ensure that the researcher initiates and progresses the PAR research process from, where appropriate, an understanding of the owner managers perspectives, views, opinions, fears and levels of self-understanding with regard to key issues under investigation and forming part of the PAR process.

It can be argued that there is a clear potential within the overall research approach and process adopted within this study for, at times at least, confusing the personal constructs of the researcher (author) and those of the research subjects. It is an intention, through utilisation of the Personal Construct Theory analytical framework,

to minimise that confusion potential. For example, by using learning and development conversations to explore the owner manager's business world through his own personal constructs, getting inside his story and empathising with him and using as a starting point the owner managers existing personal constructs of ICT and what he perceives ICT applications can do to help him and his business. And, by offering the researchers knowledge and understanding of ICT as frames of reference which the owner manager can 'try on for size', assist him in reconsidering his own existing worldviews and enhancing his perspectives and understanding levels.

Through partnership working between researcher and owner manager and through ongoing utilisation of learning and development conversations, observation and collaborative research actions throughout the entire PAR research process, including throughout case study assessment and analysis, effective owner manager personal constructions of the research reality under investigation can be derived and documented to form foundations for researcher construction of the ultimate research picture in the form of study analysis and findings.

One key challenge is of course to adequately get inside the owner manager's story and capture his perspectives and worldviews in given research process instances, and where appropriate to offer researcher worldviews and understanding as 'try on' for the owner manager – rather than to fall into one possible trap of merely progressing through utilisation of the researchers personal construct of a given situation and ignoring or over running a key perspective or construction of the owner manager which is vital to sound big research picture build up.

On the one hand, however, it can be argued that it is the rigour of the application of the component activities within the Personal Construct Theory analytical framework which adequately facilitate such research challenges. But on the other hand, within this research approach there are key underpinning added facilitators of that rigour which need re-emphasis. This overall research study is based upon the philosophical foundations of non positivism-internal realism. Internal realism propounds an inter-subjective view of reality (an inter-subjective construction of the shared human cognitive apparatus). Facts and value are considered hard to disentangle, not indistinguishable as in normativism – thus, both fact and value are viewed as being involved in scientific knowledge. Internal realism thus focuses one naturally upon

research study design in that it highlights the inevitable theory and value laden nature of our observations and thus the need to clearly spell out any underlying values and theories at research design stage (Wyer, 19990; Archer, 1988). And it is the epistemological bootstrapping process within the overall research process of this study which responds to this issue.

The epistemological bootstrapping process has provided a starting point foot holding of the research in the form of partial frames of knowledge and concepts insight which inform the study and raise key research issues for investigation. For Archer (1988), an 'epistemological bootstrap' takes the form of a 'proto-interpretative theory' which is used to read in data and loads those data with its own assumptions, Crucial insights are contained in this proto-theory which are instrumental in raising issues for investigation in the research.

And within this research study it is the partial frames of insight (the bootstraps) produced by the epistemological bootstrapping process which act as frames of reference for the researcher in his interfaces with the case study owner managers – and which alerts him to the inevitable theory and value laden nature of (his and the owner managers) observations and thus the need to clearly spell out any underlying values and theories built in to the research and held by researcher and owner manager. And in so doing also help bring focus to the nature and relevance of owner manager and researcher personal constructs and need for non confusion of perspectives held within existing personal constructs of each of these actors.

In the final analysis, of course, internal realism reminds us that the ultimate research picture built up by this study, and the component elements of insight which are progressively derived on the way to forming that big picture, are effectively an inter-subjective view of reality. In this much, whilst the research process is designed to minimise the potential for the confusing of owner manager and researcher personal constructs, it is perhaps of greater benefit to couch the issue in terms of attempting within the research process to derive perspectives from the owner manager (his personal constructs), and those of other key informants, which are not crowded out, overrun or replaced by those of the researcher and thus which appear to give a workable inter subjective-based view of the owner managers(and others)

constructions of the reality under investigation. And thus which contribute to the researcher's final inter-subjective case studies and research findings

At the end of the day it is important to remember, however, that there are limitations on ability to produce a representative research picture through such methodology. One intention of this study is to produce case material that can form the *basis* of 'clinical' knowledge whereby the approach ensures that the resultant assertions of the case research are capable of ultimately achieving factual status. And two guiding criteria in this respect are that of 'stability' in that it must be capable of reproduction and use by others if it is not to be refuted as spurious. And 'invariance' in that when new work is done on this basis, and the objects of investigation necessarily change, the question then becomes whether the work can be translated or recast so as to relate to the newer objects and still be an adequate foundation for a conclusion (Ravetz 1971).

By way of concluding this section, it is pertinent to address the issue of apparent 'mismatch' in integrated use of Personal Construct Theory and internal realism. For Kelly (1955), PCT is based on philosophical foundations of constructive alternativism involving individual construction of personal reality. Within this study, philosophical foundations draw upon internal realism involving inter-subjective view of reality. Technically speaking therefore this study utilizes a version of PCT – an inter-subjective interpretation of PCT. And in so doing is proceeding as Kelly himself propounded – that PCT as a theory will itself be subject to progressive approximation and re-approximation over time (progressive construction and reconstruction). In short, PCT is subject to its own foundation premises.

3.6. Integrated Presentation of the PAR-based Methodology in its Totality

The e-business development platform discussed above demonstrates how the work is undertaken in a practical sense. It does not show the step, processual detail of the integrated PAR based research model used in the study and the associated integration of Wyer's epistemological bootstrapping process, or how the research outcomes are measured. It clarifies how the researcher and the owner manager work together in

developing e-business within the participant firms. This section provides an integrated presentation of the research approach in its totality.

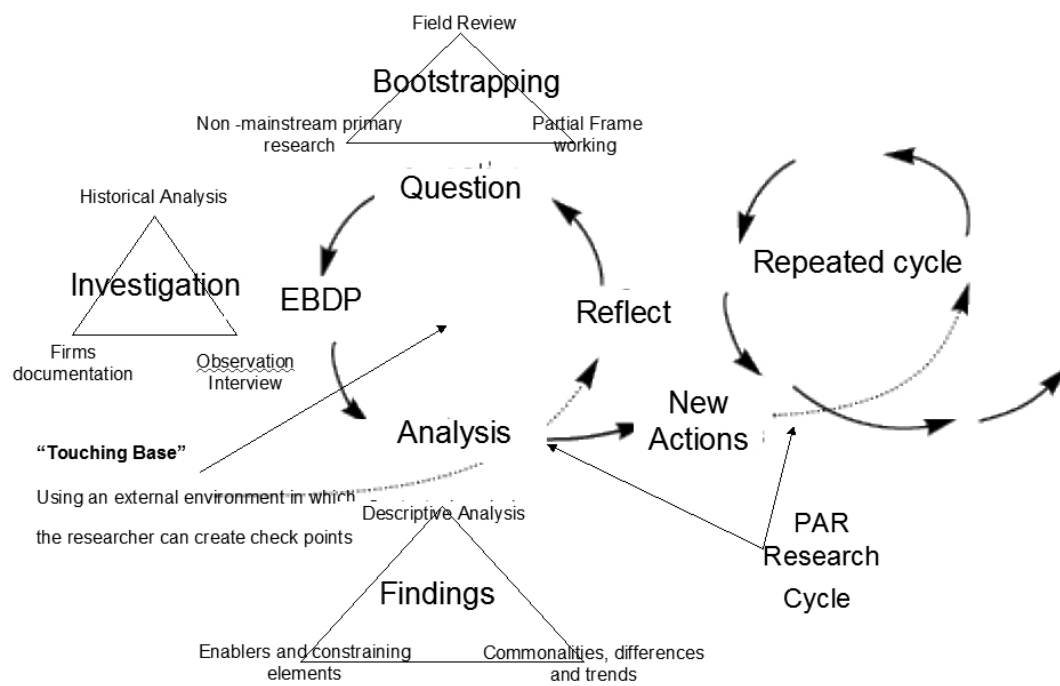


Figure 9 Final Research Methodology

As discussed earlier one of the criticisms of Participatory Action Research is its lack of academic rigor. This work uses an epistemological bootstrapping based case study research methodology, incorporating Participatory Action Research. This allows for a solid bootstrapping process to strengthen the research process. The integrated methodology is presented in Figure 9. Each triangle within the Figure represents phases of the methodology. In phase 1 the bootstrapping process incorporates the researchers own experience thus encompassing elements of Participatory Action Research which acknowledge the researchers own experience. The work does not therefore begin from a blank canvas. The researcher accepts that his or her own experiences have a bearing. This is combined with a field review which examines relevant sources of literature and draws on initial world of small business practice insight (referred to in this study as non-mainstream primary research). From this a conceptual framework is developed (from the partial frames of guiding insight from the bootstrapping process) which raises the initial research issues for investigation.

Phase 2 is the mainstream investigation. Integral to the mainstream investigation is utilization of Wyer's (1990) three pronged case study analytical process. Firstly involving an overview context historical development analysis of the participant firm; before secondly focusing on a critical or specific development incident revealed in the opening full context analysis; and then finally undertaking a re-contextualisation analysis where the specific incident analysis is reconsidered back in the full context of the participant firm. Commonalties, differences and trends across all participant case firms are at this point analyzed. Phase 2 of this study incorporates the historical analysis of the case firm through which a richer picture of the firm's development path can be achieved. This is done in conjunction with observation, analysis of company documentation and interviews with the owner manager which utilize the Personal Construct Analytical Framework described earlier in this chapter. It is at this point that the e-business development platform is utilized to undertake the practical elements of the work which are agreed with the owner manager. This is where the Participatory Action Research elements of the work (and which correspond to prong two of Wyer's case study analysis: specific development incident analysis) fully engage with the owner manager, with the researcher acting as an Application Service Provider. Importantly, the acting out and recording of the

case study research process, actions and outputs is approached utilizing descriptive analysis. Whereby issues, events and actions are considered and recorded, but also any areas of interdependence, interrelatedness or apparent cause and effect are also assessed. Moreover, presentation of case study insight, activities, processes and findings or outputs are also initially presented in descriptive analysis form within this thesis in order to capture how new knowledge and understanding is often context specific or context embedded.

Phase 3 deals specifically with the analysis elements of the study. Descriptive and contextual analysis is conducted away from the participant case study businesses utilizing recorded and documented outputs from the completed practical PAR processes and activities. Firstly the specific development incident findings are placed back within the context of the firm (this corresponding to Wyer's prong three case study analysis: recontextualisation). This initial analysis encompasses findings from the bootstrapping process which include key areas of literature based insight, key informant inputs and consideration of the wider historical development path of the firm. This work focuses on e-business evolution and does not start from a blank canvas therefore the development history of ICT within the firm will have a bearing. This may relate to legacy systems and the ICT knowledge base within the firm prior to the study. There may also be industry specific influences which determine the choices made by the firm. Gaining an understanding of this allows for the findings to be placed into a potentially unique contextual environment.

Building on this analysis an examination of the firm's processes and strategic development path *during* e-business evolution may identify any processual changes or developments that impact upon working practices, strategic development or the strategic planning process. Thus, the nature, form and sources of enablers and constraints to e-business development within the study are important. A key element to this is the use of critical or specific incident analysis. Finally, the results are placed in context with other studies undertaken and an overarching development picture can be achieved which may identify any similarities, differences or trends.

Using this model, events and actions can be evolved by going through several cycles. The work does not begin from an artificial standpoint of a traditional academic hypothesis. The inclusion of the researcher's experience and discussions within the

academic environment as the work progresses has a bearing. In Figure 6 the arrowed line shows the cyclical nature of the PAR research method, raising questions, investigation and followed by analysis. This is cyclical and flexible allowing for any part of these phases to have an effect on others. For example initial results from the investigation may require new literature to be studied, or new key informants to be consulted.

During the research process it may well prove important to use the academic environment as a checkpoint in that research process and bring any outcomes or results into an academic context. This process of “touching base” with the academic environment has several areas of potential. It allows a wider academic input into the work and also creates a more academically grounded experience for the researcher to continue in the Participatory Action Research process.

3.7. Selection and Choice of firms Studied

The choice of firms used in this work is to some extent pragmatic. All research faces limitations. In this case they could be financial, it could relate to availability of willing participant firms, it may be, technological and it may be impacted by other resource constraints. There is also the problem of finding willing firms who have the correct criteria and have enough time to devote to the research whilst still working in their core business. In this respect a set of selection criteria was established using integrated insight from the literature review and practical contact with small business owner managers and the focal research context of the research aims and objectives which the study is striving to fulfil. The resultant guiding selection criteria are as follows:

- The participant SMEs need to be micro or small in size.
- Their current level of e-business technology should not be beyond Stones State 2 (publish).
- They must be willing to adopt and try new e-business technology.
- They will have no qualified in-house ICT staff.
- They must encompass a range of SIC (Standard Industrial Classifications).
- They must be willing for the research to be conducted over a period of time (ideally at least 2 years).

- They must be willing to allow the general results of the work to be published.
- Where appropriate they will send staff to attend training sessions and be open to training.
- They must be willing on a confidential basis to share information that may be considered sensitive, for example financial data.
- They understand that as a research project it may be important that the researcher contacts others with whom the firm has a relationship.

3.8. The issue of addressing quality of research process and validity of findings (triangulation approach)

This PAR process of the study creates check points with regard to undertaken and completed processes and actions, and thus for progressive consideration of its findings, by examining several areas. These check points are examined at the outset, *during* and at the end of each case study, and include:

- A change in working practices, if any, through the development of e-business (including any potential rise to another Internet State).
- Influences e-business may have on the strategic development process.
- An examination of documentation within the case study, company records, meetings.
- Owner manager and other key informant interview incorporating identification of different perspectives with regard to issues or circumstances under consideration.

Effectively, the research approach in its totality is underpinned by triangulation: whereby richer and more valid interpretations are derived from the use of different vantage points. Embedded within the research approach in its totality are triangulation activities which are providing insight from multiple standpoints as follows:

- a) **Data triangulation:** accounts of issues and circumstances have been obtained from different participants involved in and around the participant small businesses – accommodating how perceiving and understanding are context bound.
- b) **Investigator triangulation** use of a research team as ‘bouncing board’ to gain, for example, a multi-discipline perspective.
- c) **Method triangulation:** use of different methods to collect information to increase confidence that the resultant material is not solely a product of the research method used.
- d) **Theoretical and conceptual triangulation:** the epistemological bootstrapping process ensures that the research embraces multi-theories and strands of conceptualisation – and thus removes limitations associated with explanations relying on one theory.
- e) **Levels of triangulation:** the need to look beyond the small business to the small business in context - including the effects of the higher outer economic context on the lower level business context.

3.9. Potential Limitations of the Methodology

The utilisation and deployment of the EBDP engages in Tapscott's concepts of virtualisation, disintermediation and molecularisation. The use of the EBDP in this study begins at Stones Internet State 2 (publish). Even at this early stage of e-business some processes are shifted from within the traditional boundaries of the small firm and are managed by the EBDP. Evolving to more complex Internet States via the EBDP shifts more processing to the EBDP and less functions are managed within the firm. This breakdown of the traditional boundaries of a firm (without the required ICT) and ensure that a firm can manage and engage in e-business successfully.

Thus, the EBDP may be challenging to a small firm due to a shift in business processing. Elements that were previously managed within the boundaries of the firm such as sales and marketing could be managed by the EBDP. This may create a resistance in the owner managers and the firm to evolve into more complex Internet States as they may feel they are losing control. To overcome these potential hurdles a key element of the EBDP is the use of Participatory Action Research (PAR). This involves the researcher engaging deeply with the owner managers. The use PAR brings the case study owner manager within the EBDP through “action learning”. Partnership working where no party or individual is the leader allows for the owner manager to engage with the researcher as an equal. This is an important element and will allow the researcher to be integral to e-business development within the studies.

The longitudinal (time constraints) aspect of work in conjunction with the cyclical nature of Participatory Action Research need to be considered. This longitudinal factor may prove to be a hurdle when extrapolating results. It may prove to be very difficult to determine how the personal constructs of the firm’s owner managers have shifted and any possible shift may appear at a time when the work is concluded. However, practically this research could only work from the standpoint of setting a point in time that is felt to be reasonable. This artificial cut off point can to some extent be controlled. The level of involvement of the researcher will also have a bearing. It could be the case that a natural pause in the work becomes apparent. These factors have yet to be determined and may form one of the risks of Participatory Action Research.

3.10. Ethical limitations

This work utilizes Participatory Action Research and raises ethical issues that are unique to the methodology. For Barazangi (2006);

For teaching, learning, and evaluating PAR, the theory’s goal is to increase individuals’ capacity to act on their own behalf and preventing themselves from becoming an authoritarian expert. Achieving such an increased individual capacity requires the integration and deployment of multiple dimensions of ethical principles and understanding their implications for the ethics of PAR.

There is a warning here from Barazangi that Participatory Action Research may corrupt the researcher into a situation where he or she does not work for the common

good. As an individual in this study this could happen. Being an individual in the case study environment also presents problems of the lack of time one person can spend within each study and the supporting effective use and application of the ICT systems used in the work. To counter these problems the researcher will use the academic environment as a base and a check point. This has been included in the research methodology. In specifically tackling ethical issues Miller et al. (2006) suggest that individuals engaged in Participatory Action Research.

- Include ethical issues and concerns as part of our reflective journals.
- Set up a discussion group to provide an on-going review of ethical concerns.
- Discuss ethics and values with research partners.
- Negotiate roles and expectations to articulate clear mechanisms for shared decision making.
- Be prepared to alter or even stop the project if ethical issues arise that cannot be addressed by the group.
- Be willing to confront the troubling issues of intellectual property that attend to social science research and that must be a central concern of action researchers.

These suggestions have been utilized as guiding frames of reference within this work.

4. Case Studies One and Two

4.1. Introduction

The following four chapters of this study now turn to the empirical component of this work. The case studies for this work span a range of industrial classifications and are located in the UK and Germany. They are micro and small firms with the number of employees ranging from zero to 35. At the outset of the study none had any in house trained ICT staff or operate ICT capable of e-business beyond Internet State 2 (publish). The first phase of these studies was conducted over a 21-month period from January 2004 to September 2005. The second phase was from September 2005 to June 2008. The case studies fulfil the sub objectives by focusing on the challenges and opportunities e-business can present to micro or small firms wishing to develop e-business.

The underlying approach to this study can be considered in terms of establishment of a kind of a ‘small business research laboratory’ which provides study context and focus and allows for prolonged observation of, and interplay and co-action with, all key actors in and around the research scene.

Integral to this approach is the facilitating of ‘researcher as ICT provider’ participation in small business ICT assessment and implementation activity and of description and analysis of associate management behaviours, activities, processes and outputs; and of key underlying enabling and constraining factors and forces.

A critical part of the research process and communication of that process and its outputs is the presentation of each case study in descriptive analysis form and the use of a common descriptive analysis reporting structure – thus capturing case study context, processes and outputs as a key contributor to enhanced knowledge and understanding of small business development.

4.1.1. The Research Team

An important consideration in Participatory Action Research is the role of the researcher. This is traditionally examined in Participatory Action Research through

the role the researcher plays within the research process. In this study there is the added element that the researcher is also the Application Service Provider facilitating the ICT services used via the e-business development platform. It is therefore relevant to give details on the researcher's background as this may have an impact on the study. It is also relevant to add the details of key informant inputs (the research team) that the researcher used when conducting this study.

John McCarthy - John McCarthy, the PhD researcher within this study, has a 20 year history of running enterprises in the small and micro sector. He has background in group work and group dynamics from experience gained when working in London for the GLC. He holds a B.Sc. in Internet Technology and is a member of Elite and BCS (British Computer Society).

Peter Wyer - Professor at the University of Derby and joint researcher on some of the studies and whose case study methodology this work is developed from. He is the director of studies for this project.

Don Milne - Don Milne is a lecturer on the Internet and related technologies. He is a supervisor of this work

David Rippon - Director of the University of London Computer Centre and senior government advisor on ICT and informal supervisor on this project.

4.1.2. Case Studies

The literature facilitated the development of a conceptual framework to inform the research approach to the case study component of this work. The work begins with acknowledging the historical background of the researcher. This is coupled with the knowledge gained from the literature and inputs from the researcher's key informant. In the literature Tse and Soufani (2003) suggest four premises in the adoption of e-business in small firms, these are:

P1. Avoid being fixated in pursuing technological and cost leadership.

P2. Consider all value drivers and propositions and that not one of them should be given attention priority over the others.

P3. Be circumspect when adopting e-commerce strategies, as some of them are less suitable for small firms.

P4 Realise that those strategies of large firms can influence the effectiveness of their chosen strategies

Premise one and three were considered by the research team prior to implementation of the e-business development platform within the studies. Premise two was also examined by the research team. It was considered important to ensure that the implementation of this work did impact upon or override the core activities of the firms. The role of the researcher is to facilitate “ideas” and strategies that develop from engaging with owner managers. It is also to be noted that if the firms had to pay for any new e-business systems then this may have been considered in more depth by the businesses themselves. This may have had a restricting influence on the e-business development within the studies. The studies also did not have the required knowledge to make informed decisions. Premise four is not applicable to this work. None of the businesses studied were involved with ICT systems that engaged with larger organizations.

4.1.3. Inductive Logic

Chapter 3 discussed the nature of Participatory Action Research and its use of inductive logic. In this study there are two types of key informant inputs. One is based on case study specific inputs and these are placed within each study. The other is the inductive logic and experience of the research team. The inductive logic suppositions made in this work often stem from consultation with the researcher’s research team advisers.

The inductive logic suppositions of the research team raised potential areas of focus for the researcher relating to the implementation of e-business. When undertaking this work the research team felt it was important that some of the more mundane aspects of e-business implementation should be examined. Examples of this would be the configuration of the e-commerce and Content Management Systems packages used. The research team’s previous experience in dealings with individuals and companies had shown that new users of web based systems have difficulty

understanding the nature of server based applications. Often these users feel that unless a system is located on their local workstation they do not have “ownership” of the application. In this research it is often the first time that users will experience an application that has several user levels and hosted on a remote server located outside of the traditional boundaries of the firm. This potential initial entry level hurdle needs to be managed by the researcher to enable further work to be undertaken successfully to build the application, and thus proceed with the study.

This work now turns its focus to the case studies themselves. The inductive logic of the research team and the academic sources of insight used to create the conceptual framework are now placed within the bootstrapping process to initiate the research within each study.

4.2. Case Studies at the onset of the work

At the outset of this work an examination of the case studies current ICT was undertaken and this is detailed within each study. This information was gathered through interviews, meetings, emails, company records, and key informants. Their current ICT relationship strategies were also examined. This information will be used to determine if their relationship strategies will change or modify if they develop more complex e-business systems.

Table 10 provides details on how the firms at the outset of this work used ICT in differing relationship contexts. That is what ICT they used with suppliers, distributors and others. Fax and telephone have been omitted from this table as they are common to all relationships. The results were common to all the case studies.

Relationship to the firm	Hubs and Networks	Search Engine	Email	Government and Industry Portals
Suppliers	B2B exchanges seek new suppliers	Seek out new suppliers	General communication (inform on new products)	Information on regulatory changes and general market news
Agents (extended enterprise)	Data exchange and advice	Seek out new agents, understanding of the market	General communication and exchange of data (accounts etc)	Information on regulatory changes and general market news
Distributors	B2B and B2C	Seek out new Distributors	General communication	Information on regulatory changes and general market news
Competitors	Understanding of competitors market share	To gain information on competitors shops etc.	Join competitors newsletters to gain understanding of the market	
Potential Customers	Potential B2B and B2C exchanges		Specific enquiries	
Customers	Seek out new B2C maintain B2C		Specific problems or enquiries	

Table 9 ICT use in relational contexts within the case studies prior to the research

Although the firms used email for some aspects of communication with customers, none of the case studies sent out mass emails and therefore did not engage in mass Customer Relationship Management (CRM).

In all of the case studies it is to be noted that no ICT processing takes place internally (within the firm) except on local workstations. Data and information is gathered and collated via electronic and paper means on single workstations. This is to be expected as none of the studies has a complex ICT infrastructure.

4.2.1. Case Studies

The first two case studies were not completed and thus were not subject to all the rigour of the methodology. This was due to the studies being terminated early for reasons highlighted within each study. Though not completed the reasons why have an important bearing on this work and therefore have been included. They offer valuable insight on the relationship strategies that may be required by an e-business provider. They also highlight important issues within the strategic development processes of the firms.

4.3. Case Study One

4.3.1. Overview

The first study is a knitwear manufacturing company based in the Midlands and has been in existence for over thirty years. They have 30 employees and turnover £3.5 million per annum. They supply garments to many top high street names in the UK and overseas markets. In the 1970s the production of garments was undertaken in the UK. In the 1980s this changed when strong competition from the Far East and increasing UK labour costs placed the firm in an uncompetitive position. To address these issues the production of garments was moved to Eastern Europe where labour costs were less expensive. The design and sales departments were retained in the UK, which are seen as the key areas of knowledge and skill within the firm.

4.3.2. Background and Development of the Study

Three years ago the company was involved in a management buy out and is now owned by two directors. These directors were part of the senior management team of the old company. The previous owner and director sold the firm when he retired. The new directors invested in the company by purchasing machinery that enabled the design and production of prototype garments in the UK. This addition to the capabilities of the firm built on the previous owner manager's European development of the manufacturing arm. This enables the sales force to show sample garments to the high street retailers much faster than their competitors. Thus, the new owners

invested in machinery that assisted them to have a more effective market penetration. During their strategic development processes they understood that if they could produce rapid samples that could be used by sales staff it would give them an edge over their competitors. Samples allow for the “look and feel” of the garment to be seen with greater clarity and issues of quality and choice of material can be reviewed with the customer at an early stage. These samples demonstrate the product without the expense of a full production run. Rapid short UK based production of sample runs allow the firm to reflect the latest high fashion trends and test these in their marketplace without the expense of a full production run. The sales team using these samples can now give immediate feedback to the design and quality control arms of the firm. This gives the directors the ability to make “real time” decisions about the production of garments before manufacture in Eastern Europe. This is very important to high street clothing retailers who wish for the latest trends and fashions to be “in store” very quickly. Thus, they had a competitive advantage resulting from actions that were initiated during their strategic development processes.

4.3.3. Current ICT Structure

Location of ICT services at outset of study	Type of ICT support (at onset of study)	ICT Relationship Strategies at the outset of the study
ISP and in house	No ongoing support – hardware and software purchased by owner managers using consultancy when required	Telephone; facsimile; mobile telephone; PC; networked PCs; Internet; electronic mail

Table 10 ICT location and relationship strategies at the outset of the studies

In terms of relationship strategies ICT was not used within the firm in any advanced way. The usual means of telephone, fax and email were utilized as well as simple file storage on a server. No data processing occurred on the server. Group access to files was enabled via a shared folder, though interviews revealed that this was not fully understood by the directors.

ICT used for data gathering, collation and processing (internally)	ICT used for data gathering, collation and processing (externally)
Fax, email, spreadsheet, accounting software, telephone.	Hubs and Networks, Government and Industry Portals, Search Engines, email, telephone, fax, competitors, web sites

Table 11 ICT used for data gathering, collation and processing prior to study

Email was seen as a rapid form of communication but was only used in the UK, and not used with the manufacturing arms of the businesses located in Eastern Europe. Fax was used to communicate with manufacturers. This was viewed as a more reliable form of communication. None of the directors understood how to send an email with a file attachment. An example of this and the level of understanding of ICT by one of the directors was demonstrated in an interview.

The director explained that finished garments need to be packaged by the manufacturer prior to shipping. This is done by placing a clear plastic bag over the product and by hanging a label around the neck of the garment giving details of the high street store (each batch of garments can have a label per high street outlet). The label hangs in a particular way with the product details facing outwards to ease the storage and distribution of the product in the UK. This has not always been done by the manufacturers and has caused problems in the UK when distributing garments. The directors have telephoned the manufacturers on several occasions about this but the problem remained unsolved. The researcher suggested that as they were capable of receiving faxes they could also receive email as they have computers connected to the Internet. The director could send a photograph of the packaged garment to the manufacturer to demonstrate how the products should be packaged. Alternatively the director could create a web page with the photograph on it which could be viewed on line by the manufacturer. These ideas were well received by the director manager who asked.

“You can create a web page with the finished product on it showing how it should be packaged?”

The researcher answered by saying it could be done via email or a web page and that a Content Management System could be used so that the firm itself undertake this and would not need outside specialist help. At this point there was a clear shift and development of personal construct of the director in terms of the perception and understanding of relationship strategies that could be utilized via ICT when dealing with internal suppliers. Using a web page as a point of information would add to the relationship strategies used by the firm. The director seemed pleased and impressed with this idea.

4.3.4. ICT web based application(s) utilized for Participatory Action Research

Internet State prior to ICT PAR	Tapscott theme	ICT used for study
2 Publish	Virtualisation	CMS

Table 12 ICT web based application(s) utilized for Participatory Action Research

Building on this idea the researcher suggested that the firm could utilize a Content Management System to allow the firm to update its own content. The company has a web site but it is “static” and needs specialist ICT staff to change or add content. It had not been updated for a considerable time. The director then stated that the firm was expanding into the German retail market and having a multi lingual web site may assist in sales and asked if the new proposed web site could be multilingual. At this point the director was mentally examining how e-business could assist the firm’s strategic development with regard to its aim of increased market penetration. The researcher replied “yes”. The director took this to mean the site would auto translate the content from English to German. The researcher replied that the site needed content supplied in both English and German and could be displayed according to which country the site was being viewed in. At this point the director acted in a very disappointed manner. Progress in explaining how the Content Management System operated and could be used became difficult. The researcher felt he was then discussing e-business within the context of leveraging maximum return on investment. This was clearly not an issue as provision of the systems was an integral part of the research and thus free of cost. It seemed that the nature of the business the director

was in had placed him in a mindset that could not initially perceive this. The aggressive and competitive nature of his industry sector when dealing with suppliers (and he was viewing the researcher as a supplier) meant he felt obliged to get maximum value out of a negotiation. This is how he has learned to deal with suppliers, and thus his personal constructs meant he also dealt with the researcher in this manner. He at first could not understand that this was a research project. This may have been the fault of the researcher not explaining things clearly, though care was taken to ensure this was done.

Once he had seen this he then drove the negotiation to attempt to provide a system that required no input from his company or staff. This seemed to be more to do with driving value from what he perceived as a supplier (the researcher) than it was in attempting to understand the ICT systems.

In general, the dealings with this case study were not friendly or relaxed. The director when dealing with suppliers has an aggressive attitude. The industry sector he is in is very competitive and this was reflected in the behaviour of the director when dealing with suppliers and he viewed the researcher as a supplier of ICT services. He saw the value of using ICT services in communication with his factories in Eastern Europe and creating a new e-presence in Germany via a multi lingual site. However his relationship strategy with the researcher meant the study would be difficult. Following a consultation with the research team the case study was terminated as the team could not see any value in continuing. The director of the firm was informed.

4.3.5. Analysis and Evaluation

The key areas that this study highlights are based in the relationship strategies that the ICT supplier (in this case the researcher) and the director of the firm both use. Then longitudinal requirements of e-business to be embedded within a firm are considered. The analysis then turns to the evolution of e-business within the firm and its relationship to others. These elements are first placed within the potential development of e-business within the firm that could have occurred and the impact that the director's personal constructs had on these possible developments.

In this study there is no shift in terms of Stone's Internet States. The development of the e-business via a Content Management System would have enhanced communication via a web interface to internal suppliers in Eastern Europe. Design and packaging specifications presented via a web site to suppliers would enable a clearer understanding of what was required. Enabling this would have resulted in a virtualisation of the manufacturing specifications and assist in overcoming language problems. The multi lingual element of the system could also have been useful in informing and attracting German customers. Therefore there were potential advantages for the business to adopt web based ICT. Initially the director perceived this, his personal constructs shifted. When the conversation and negotiation moved on to the use of a multi lingual web site things changed. The director made an assumption (either real or for the purpose of negotiation) that the Content Management System would auto translate content placed on it. This may have been due to the personal constructs of the director having the assumption that ICT "can do all things" or may have been a posture to drive down price by highlighting what he felt were perceived weaknesses in the system. The result was a criticism of the Content Management System. To the director it now failed to do what he felt it should do. Either he did not know enough about the system (in other words understanding the system was not integrated into his personal constructs which is highly probable) or he knew about translating capabilities and was attempting to deride the system to reduce the price. In either case this stopped the director from gaining a deeper understanding of e-business. He may have then seated the discussion in price negotiation issues because he felt familiar with this and thus his personal constructs were not being further challenged. This may have been the case if he was unsure of how to proceed or unwilling to learn more at this point. He may have felt he had learned enough at this stage.

All of these issues and problems may well have been overcome by the researcher being more skilled at negotiation and explaining the systems and what they do more effectively. However every posture that was adopted by the director seemed to negate the opportunity to do this. He perceived the ICT enabler (the researcher) as a service provider, thus falling into the customer/supplier chain. Whilst this has merit in some areas it failed to expose the full potential of ICT for the firm. It is the dialogue of learning and development exchanges that could occur between the

director and the researcher that may enable a more effective use of e-business within the firm. In this study this was hindered because of the director's existing personal constructs. Also the relationship strategy he uses when dealing with suppliers and which he appeared to use towards the researcher may be inappropriate when engaging in learning and development dialogues. This may not be the case for all owner managers who often utilize suppliers and key informant inputs. They may though utilize the supplier in a learning and development context once they have been established within the firm. Initial negotiations with suppliers are often based on price and service delivery. Once these have been established then a more informal relationship may develop which allows for learning opportunities.

Stone (2003) suggests that developing e-business within the small firm will meet hurdles to adoption through a potential resistance to change in working practices. These working practices may challenge the personal constructs of those that are involved with the day to day operation as well as those who make the decisions to implement the systems. In this case study we can see that the personal constructs of the director did shift and a minor change in working practices would have occurred with the addition of a visual communication channel with manufacturers. This would also have impacted upon the relationship strategies the firm uses. However no other change was considered at this stage, confirming resistance to e-business evolution for the reasons stated.

A possible key reason for the failure of the study was that the personal construct of the director was rigid in terms of his perception of ICT. Outside of his learning about emails and web page display of products he could not see what was possible. He may need more time to absorb this new learning and then see how e-business could impact upon the working practices at a later date.

The director is willing to innovate as he had invested large sums of money in knitwear machinery. He had a clear understanding through his past experience of how this knitwear machinery operated and what it could achieve. He had evolved the sales mechanisms of the firm via the strategic planning processes by using this machinery to make samples. He had incorporated this into the sales cycle and thus had a very rapid response to current trends in his industry. Thus the firm was able to react quickly to some changes in its external environment. His view of ICT was as a

machine or device that could supply his needs and perhaps in his personal constructs similar to the knitwear machinery, a device that performs a function. Naturally this is possible but without experience of e-business and an understanding of its capabilities it is very difficult to exploit its full potential. The use and limits of the ICT are embedded within the existing personal constructs of the director within this firm. Because he could not see what was possible with regard to using e-business technologies, he cannot incorporate e-business into the firm's strategic development processes. Importantly the director by also placing ICT provision within the confines of the customer/supplier relationship hindered the effective growth of e-business.

He had little knowledge of how data created by ICT can be utilized within his firm. This can be seen by his general lack of understanding of ICT. He did see how it could be used in his relationship strategies with manufacturers. When this shift in his personal constructs occurred, the value he placed in the ICT provision rose. He incorporated this potential of ICT within his communication procedures with manufacturers and this changed his relationship strategies. Although this development of his personal constructs allowed for a change in his communication methods it didn't allow him to examine the ICT systems more fully. This may be due to the fact that at this stage the limits of his learning potential for ICT had been reached. And this may develop more fully as his potential for learning increases after he has had time to absorb these notions. At this time he may have felt comfortable that he had learned something about ICT and thus had "ownership" of this learning. He no longer needed the ICT supplier to assist with this. Therefore he could return to his "comfort zone" and his business development processes as being part of his firm and his ideas within his own current personal constructs. This return to "insular" development and utilisation of ICT fits well with him being a director of the firm and the key decision maker but hinders e-business development through a lack of knowledge of what its capabilities are. This is compounded by the director not viewing the ICT supplier as a source of knowledge and ICT capability but as a supplier of a service. He had the opportunity to "try on for size" the personal constructs of the ICT provider (researcher), but was unwilling to do so after the brief initial learning.

E-business also needs to evolve in a firm according to the understanding of the users of it and with regard to those they deal with. In this study it would be pointless if the director sent emails that the manufacturers could not open or have the ICT to read them. Both parties need to understand what is happening. To achieve this there needed to be the joint learning of the director and the suppliers to allow for this development. To overcome this e-business growth may be best achieved over a period of time to allow for the concepts of e-business to develop gradually within the personal constructs of the owner manager. Once this has occurred then the potential impact on working practices can be understood by the owner manager and thus within the organization and in its relationships with others. This moves beyond the understanding of logistics and “external” business process analysis traditionally undertaken by ICT providers. More depth and breadth of understanding of key issues surrounding the small firm and its owner manager perspective is needed. It requires an e-business enabler to better understand the personal constructs of owner managers in terms of the learning processes and the relationship strategies that the owner manager and thus the firm utilize. This cannot be achieved easily if the relationship is based solely in the customer supplier relationship. It may begin in that context but will need to evolve into a more trusted relationship. This may then develop into owner managers utilising e-business tools in the firm’s strategic development processes as well as enhancing working practices.

4.4. Case Study Two

4.4.1. Overview

This study began with a well established firm of accountants. They have over 100 employees based in several branches throughout the South East of England. In the initial stages of the study the researcher gave a presentation on small business ICT issues at a local business breakfast club and asked if there were any willing case studies for this work. The researcher became friendly with a junior partner of the firm who sought agreement with the senior partners of the firm for the study to be carried out. This was granted and the study commenced.

In preparation for this case study the researcher interviewed a retired senior partner of the firm as a key informant. This was done to gain a contextual overview of the firm and of accountant firms in general. In the discussions relating to accountant's relationship strategies the researcher asked how micro and small firms view the relationship they have with their accountants. He replied that many micro and small firms view the relationship as one based on trust and the accountant is based within the firm's extended enterprise.

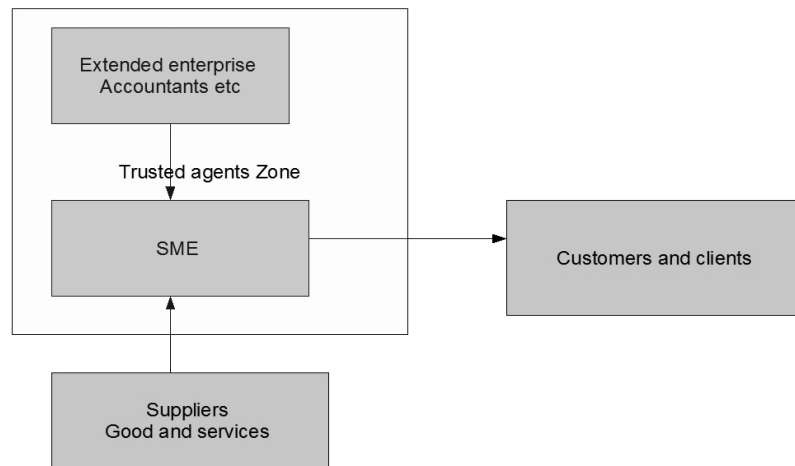


Figure 10 Trusted agents in the extended enterprise

In Figure 10 it can be seen that although accountants are in fact suppliers of services, due to the confidential nature of the information they deal with in a firm they are placed in a different position. They fall outside of the customer supply chain. Accountants often discuss the problems their clients may be having or assist with development plans. They are engaged to produce financial figures about business to potential lenders and regulatory bodies. The confidential nature of this type of work often engenders trust between the accountant and the client. They become a “trusted agent” of the firm. The relationship that forms may continue for many years and strong bonds may form. The key informant had formed some good friendships with his clients during his working life. He felt that the long term nature of the relationship fostered was an important factor in developing trust and in assisting the small firm through good times and bad. The issue of extended enterprise and trusted agents zone is thus a key dimension within this case study and the research in its totality.

4.4.2. Background and Development of the Study

This study began with a series of interviews with the junior partner. The junior partner although interested in the study stated he had no real knowledge of ICT. An examination of the ICT systems within the firm was undertaken by the researcher. The ICT examination and interviews revealed the firm had a server and network links to other branches and this was supplied by an ICT company which the accountants used on an infrequent basis when required. Once this ICT information had been gathered the researcher met with the research team to establish the way forward with the study. The research team felt that the following points were important.

- The study should not interfere with the day to day running of the firms current ICT systems
- The researcher would respect the relationship the firm had with its current ICT supplier
- The research team would monitor the study to ensure that the development of any proposed IT systems met the objectives of the study

The team examined the results of the key informant contextual interview the researcher had with a retired senior partner of the firm. In this interview the inductive logic of the researcher had led him to ask about how the firm had utilized ICT in its relationship with its client base. This revealed that some of the partners of the firm used email to communicate with clients but no other ICT was used. Some partners in the firm did not use ICT at all for communication and relied on telephone, fax and face to face meetings. When interviewing the junior partner he stated the same was still true of the firm “today” and was willing to see if ICT could enhance communication with its client base. The research team discussed how this could be achieved without a disruption to their current ICT services and be effective in enabling this communication. The research team returned to the findings of the contextual interview.

The retired senior partner felt that most firms get into financial difficulties through poor financial planning and management. The researcher by creating new forms of communication for the firm and its client base could open new channels that allow for data from clients to be more readily available to accountants. If the data were available to the accountants freely and easily without the need to see the clients personally, potential pitfalls and problems may be avoided at an earlier stage, thus keeping the clients away from potential difficulties. The accountants could step in at an earlier stage and advise the firm.

The research team examined the ICT systems that could be used to achieve this and decided that a web interface using a Content Management System was the best solution to adopt. The firm’s web site was outside of the realm of the ICT supplier they used for their internal branch network and would allow for the development of the system without any disruption to current ICT services. This was proposed to the junior partner who agreed and work on the system commenced. The system was developed into a prototype.

As the study progressed it became apparent that the accountancy partnership was in a state of flux after many years of trading. There had been major disagreements between several of the senior partners. The researcher found out from interviews and exchanges with the junior partner that the senior partners were having a major disagreement over the future direction of the firm. Some partners wanted to move

towards a smaller but potentially more lucrative client base of larger firms and not target micro firms for future business. The other partners felt that to exclude micro and sole trader businesses would remove the “bread and butter” business the firm had established. The final result was that half of the partners broke away and formed a new company. The junior partner who the researcher had a relationship with was joining the new firm and asked if the researcher would continue working with them and advise them on how they set up their ICT systems in their new office. The junior partner was the researcher's primary contact within the firm and in order to continue the study the researcher agreed.

The new firm was considerably smaller than the old firm with only five partners and one employee. They rented offices and began to have them refurbished. One of the senior partners in the old firm funded the start up and development costs. His view on the business was that the smaller firm's accounts still provide reasonable revenue and was not to be overlooked and that they took trade in whatever form it came no matter what the size of the firm.

The researcher conducted an interview with the new head of the firm and discovered his aim was to develop his business in the first year by migrating those clients from his old firm (that wished to move) and then to grow and develop his client base. During the interview the head of the new firm made it clear he was not very interested in meeting the researcher and insisted after the first interview all future interviews be conducted with the junior partner.

The study progressed. During an interview with the junior partner the researcher was asked to assist with the purchase of new ICT equipment for the firm. The researcher was also to advise on the installation of required ICT services for the day to day running of the firm. The new firm inherited the relationship strategies of the previous firm in terms of ICT and these can be seen in the Table 14.

Location of ICT services at outset of study	Type of ICT support	ICT Relationship Strategies at the outset of the study
ISP and in house	No ongoing support – hardware and software purchased by owner managers using consultancy when required	Telephone; facsimile; mobile telephone; PC; networked PCs; Internet; electronic mail;

Table 13 Case Study 2 ICT location and relationship strategies at the outset of the studies

The old firm had a server with data storage and back up. The new firm purchased a new server for data back up and file storage. In the conversations the researcher had with the senior partner and others they freely admitted they had no knowledge of ICT other than how to use certain programmes on local workstations. They utilized a range of accountancy software and were aware of government portals for tax issues. The researcher, as part of the case study, configured a server in the new firm for data back up and files storage.

ICT used for data gathering, collation and processing (internally)	ICT used for data gathering, collation and processing (externally)
Fax, email, spreadsheet, accounting software, telephone.	Hubs and Networks, Government and Industry Portals, Search Engines, email, telephone, fax.

Table 14 Case Study 2 ICT used for data gathering, collation and processing prior to study

The senior partner of the new firm had a computer on his desk for the first time in his career as he felt he should have one, though he freely admitted to the researcher he had no idea how to use it. He did not have a computer in the old firm. His role in the previous company was based upon bringing in new clients and this was done via the development of new relationships with potential clients, not using ICT in any way.

In the previous firm he was one of several senior partners, in the new firm he was the sole senior partner. This new role meant that he had to take on board considerations that he had not done previously. One of these roles was in the development of ICT. He was now also fully responsible for the overall strategic development of the firm.

He therefore felt that he should use ICT but had no knowledge of how it could be used. The researcher installed a network for the computers and configured all the workstations. The junior partner was still keen to develop the web system and work on this continued.

4.4.3. ICT web based application(s) utilized for PAR

Internet State prior to ICT PAR	Tapscott theme	ICT used for study
2 publish	Virtualisation	CMS -groupware

Table 15 Case Study 2 ICT web based application(s) utilized for PAR

The web site would be based within a Content Management System and allow client uploads of data. These could be readily monitored by the accountants thus making information more freely available. During the time the researcher was setting up the new ICT for the firm he had several meetings with the junior partner of the new firm to discuss the progression of the system and general ICT issues with the new installation.

The junior partner invited the researcher to lunch one day and offered him a directorship of a new company that the accountants proposed to form providing ICT services to its client base. They clearly saw the value of the ICT services and saw an opportunity to develop a new arm to their business. The partners did not have the skill set to enter into this business and the researcher was to “head up” the new firm.

Their strategic development discussions had included incorporating ICT as a revenue mechanism via the researcher. They made a strategic decision to try and incorporate the researcher’s skills into the firm. The junior partner suggested that the researcher drop the idea of the web system and concentrate on focusing effort on the firm’s clients ICT needs. After the researcher had consulted the research team the offer was politely refused. The research team explained to the researcher that these things often happen to researchers undertaking a doctorate and as such were a distraction to successful completion, though it was made clear it was the researcher’s decision alone, they could only advise. The researcher made it clear to the case study firm,

and in particular the junior partner, that he was still happy to continue the study and develop the web site if they still wished. They agreed and work progressed.

A few weeks later the researcher received a telephone call from the junior partner asking him if he knew anything about databases. The researcher replied that he did and was then asked to look at a collection of disks that contained data. Upon examination of the disks it became apparent to the researcher that the data belonged to another firm and was not that of the accountancy practice. The researcher asked for clarification regarding to whom the data belonged. The junior partner said he would seek clarification and then telephoned the researcher to say that the data belonged to a rival firm of one of the senior partner's clients. The researcher contacted the research team as this was a clear breach of the ethical code of the research. The research team confirmed the views of the researcher and the researcher telephoned the junior partner and said he would not undertake this work. The junior partner understood this and felt the researcher was behaving ethically.

The refusal to form a company and unlock the database had a detrimental effect on the relationship and thus the study. At this point communications ceased and the case study ended.

4.4.4. Analysis and Evaluation

The analysis of this study begins with the setting up of the new firm and its use of ICT installation and implementation. It then goes on to examine why the case study attempted to incorporate the skills of the researcher into the firm. Finally an examination of important ethical issues is raised.

The senior partners planning and development processes for the new firm included ICT installation, His personal constructs formed in the old firm dictated that ICT provision was an element he needed for the new business. The fact that he had a computer on his desk for the first time in the new firm showed that he wanted to be seen to be involved in ICT at least for email communication but did not know how to utilize it beyond that point. This could be a reason why the senior partner without any real knowledge of ICT had ordered ICT to the same level as the previous firm. He assumed that a repetition of the ICT structure in the old firm would be sufficient

to enable ICT use in the new firm. He did not undertake any analysis of what was required in terms of ICT provision for the firm, thus he could not make any informed decisions about ICT use.

This was hampered by the fact that during the study the senior partner was not willing to communicate directly with the researcher beyond the first interview. This could be due to the fact that the senior partner felt a level of discomfort discussing ICT with the researcher as he did not have any knowledge of ICT and this was not a situation he felt comfortable with. As the new head of the firm he may have felt he should know at least something about ICT. This discomfort may have been a barrier to the senior partner engaging more fully with the researcher and developing a learning dialogue and thus progressing ICT development.

The senior partner did see the value of e-business provision as a means of leveraging revenue from his clients. He saw the value of ICT in creating a new economic revenue stream for his business and realised that he did not have the current skill set within the new firm. He therefore attempted to bring those skills in by engaging with the researcher by forming a new company. His strategic development aims and direction were influenced by the possibilities that ICT could bring by attempting to form a new company with the researcher.

To do this the senior partner's personal constructs had been influenced by the potential of ICT and the researcher. He wanted to use the ICT skills of the researcher within his clients' firms and thus the main focus of his aim was to lever a financial return, not in the development of e-business within his own firm.

To some extent this is a natural posture for a business person to adopt. Importantly, he did not seek any e-business development within his own firm where he had control. The senior partner had no intention of learning about or understanding e-business and therefore changing his working practices to accommodate e-business potential within his own firm. When the researcher was offered a directorship of the new firm the idea of the web systems was to be dropped. This demonstrates that he had no intention of developing e-business beyond its current state.

The senior partner's decision had an impact upon the organization as a whole because e-business could not develop beyond Stone's State 1 as he had control

within the organization. The personal constructs of the senior partner did not adjust to allow e-business development in his own firm. The control he has of the firm may be a stumbling block to any future ICT development but the study was terminated before these issues could be examined.

4.5. Assessment of Research Methodology and Practice to date

At this point in the study a research team meeting was held to evaluate what had happened in the first two studies. Neither of the studies had been followed through to completion and this was cause for concern. The research team examined the following areas to see if improvements could be made before the research continued with regard to:

- The research methodology
- The impact of the EBDP
- The relationship the researcher established with the case studies owner managers.

4.5.1. The Research methodology

The research team after review felt that the methodology was appropriate for this type of case study work. In particular, the Personal Construct Analytical Framework used was then focused on and was considered important as it is a new element in this work. The team felt that although the case studies had been difficult and no study had been completed they had revealed key insights. In particular with regard to the impact of the owner manager's personal constructs on e-business development. However, until a case study was undertaken that allowed for a study to progress further full analysis was difficult. The research team then discussed other new elements of the methodology.

4.5.2. The Impact of the E- Business Development Platform

Tapscott (1996) predicts that many of the traditional boundaries of a firm will break up. He clarifies this by his explanation of his concepts of virtualisation, molecularisation and disintermediation. In adopting these concepts, business processes that used to occur within the boundaries of a firm may now be undertaken by the EBDP. As highlighted in the methodology chapter this may create reluctance in owner managers to adopt these new practices as they feel they will lose the locus of control. None of Tapscott's concepts had taken hold within the firms. However it may be that the simple movement of business processing to outside of the traditional boundaries of the firm had caused some problems. These may be proving to be a greater hurdle than first predicted. The research team felt that the means of resolving this was seated in the relationship and the relationship strategy the researcher had with the case studies. Importantly it was also the issue of who the researcher had a relationship with.

4.5.3. Engaging with the firm at a senior level

The research team felt that a key element in the facilitation of e-business within a firm was the learning and development dialogues with the owner manager. Although this had been done in Case Study 1 it was not done in Case Study 2. The distancing of the researcher in Case Study 2 from the owner manager via the junior partner meant the study was not as full and rich as it could have been. The final ICT decisions are often made by the owner manager and in Case Study 2 were made by the senior partner.

Therefore if the researcher engages at a level below the owner manager hurdles to e-business can present themselves because the owner manager may not see what is possible through the development of e-business. In Case Study 2 the senior partner's ICT learning and development was second hand via the junior partner, thus not allowing the learning and development dialogues to take place. The junior partner's limited personal constructs and position of authority constrained a building up of understanding as to what e-business can do. The senior partner was informed second hand by the junior partner and thus he could not engage in the learning and development to enhance his personal constructs of ICT that was needed to implement

e-business. The team felt that this level of engagement was vital for the study and successful e-business implementation in the small firm. This senior level engagement was to be sought in future studies.

4.5.4. The owner manager and the researcher

E-business can have an impact on areas of the firm that may not be apparent at the outset. Therefore the researcher when dealing with owner managers should be seen to gain an understanding of the business problems of the firm and not just ICT. The dialogue may establish a trust that facilitates a stronger and deeper relationship between the e-business provider and the owner manager. This may also facilitate a greater insight into how e-business can be applied within each study as it may broaden how the owner manager perceives the possible use of e-business.

The research methodology does allow for a full picture of the history and development of the firms studied. Engagement with the owner manager allows for build up of the understanding of how the owner manager sees the development of the firm and its future direction. This dialogue relating in particular to build up of understanding of the firms' overall history and direction will be emphasised in future studies.

The research team also considered the position of the owner manager in relation to the research. The owner manager may feel the researcher has an understanding of the firm but he does not have an understanding of the researcher and the research process. Therefore once a relationship is established with a senior person within the firm, ideally the owner manager, then a relationship of trust needs to be developed. In this relationship the researcher needs to be open and frank about the research process and what its purpose is. This may help in easing any fears that the owner manager may have as these may hinder learning and development dialogues. Participatory Action Research involves all participants in the research process and is considered vital. If the owner manager is not engaged in this process then learning and development may not occur. If this does not happen then any development of e-business may be difficult to achieve.

4.5.5. E-business providers would be best suited to a place in the companies extended enterprise as a trusted agent.

Both of these studies highlight the importance of the relationship between the e-business enabler (the researcher) and the owner manager. The research team felt the challenges e-business presents to working practices and the possible impact it has on the personal constructs of owner managers is great. To address this issue when implementing e-business the researcher should adopt a position within the firm's extended enterprise. This is similar to accountants and was considered vital by the key informant interviewee in Case Study 2 for his firm.

Accountants are trusted agents of a firm and do not sit in the customer supply chain. Accountants also work with a business over a number of years. This long term relationship which involves the sharing of confidential data engenders trust. The partnership that develops means that the business often turns to an accountant for advice. Accountants are therefore often included in the firm's strategic development process. The research team felt this long term relationship which is based on financial issues may be equally applicable to e-business. Whilst price and service provision are valid issues they need to be placed within a wider context of an understanding of e-business and the long term relationship that needs to be fostered. A trusted agent relationship may assist with this.

A shifting of the e-business enabler to the extended enterprise may allow an ICT researcher to engage more fully with the owner manager in learning and development dialogues. This may have an impact upon the strategic development processes within the firm and thus e-business development. In Case Study 1 it can be seen that perceiving the researcher as an ICT provider in the customer supplier chain failed to lever the best outcomes needed to facilitate successful e-business implementation. The positioning of the researcher in the customer/supplier chain reinforced the personal constructs of the owner manager when dealing with suppliers. Value and leveraging the best return became priorities whilst learning and development were secondary considerations. It therefore became difficult for the researcher to become actively involved in the strategic development processes within the firm. A position in the firm's extended enterprise may have overcome this.

Case Study 2 also demonstrates the value of being seated within the extended enterprise. This position facilitates the opportunity for learning and development dialogues between the e-business enabler and the owner manager at a much earlier stage in e-business development due to the perception of the owner manager because of the relationship strategies employed by the researcher.

The owner managers of the first two case studies did not have the knowledge of the potential of e-business provision and they are therefore perhaps not suited to be a wise consumer. Thus placing e-business enablers in the supply chain fails to lever the best results for the firm. This has to be tempered with the fact that many micro and small firms feel that the ICT industry has levered far too much (DTI 2004, 2005) from them with little real return. Many small firms are reluctant to invest in more ICT when they feel they have done so already with no real return.

E-business provision can impact on business practices through various means but these owner managers are viewing the services provided via the knowledge they currently hold within their own personal constructs. In these case studies this is at the very low end of Stone's Internet States. They are not making decisions based on all the possibilities and this makes e-business difficult to grow without the knowledge of what could be achieved. This hinders the development process. The position as a trusted agent enables the possibilities of evolution of e-business to occur, possibly over a period of time to allow the personal constructs of the owner managers to develop in relation to e-business.

In order for this to be achieved the personal constructs of the owner managers in Case Study 1 and 2 needed to be fostered and developed in relation to e-business. This may also allow for the e-business enabler to be included within the strategic development processes within the firm, via a trusted agent's status. The owner managers in the first two studies were not used to learning and developing from within the customer supplier relationship when dealing with ICT, at least at the outset of the relationship. A position in the extended enterprise as a "trusted agent" would be adopted by the researcher in future studies. Integral to this would be ensuring the owner manager understood the researcher's objectives, the research process, and the researcher understanding the wider issues faced by the firm.

5. Case Study Three

5.1. Introduction

This firm is based in the retail and healthcare sector. It has been trading successfully for over 50 years selling optical goods and services. At the outset of this study the firm is owned by two partners. The two partners have not been involved in day to day management for over 25 years. The firm has eight branches all within a 25 mile radius of the head office. It has 35 employees with one manager at each branch supported by specialist optical employees and general assistants/receptionists. Head office staff comprise of a general manager and a financial administrator who are both non-executive directors. Its annual turnover is £1.5 million per annum. It is experiencing a slow down in sales that is common across the industry sector in smaller firms. In the last decade large corporations have moved into the optical industry causing the market to become more aggressive. The researcher feels that it is important to state that he has a personal relationship with the financial administrator of this firm. Some of the insights that are gained in this study may not have been achieved without this relationship.

5.1.1. Background and Development of the Study

The research team had decided that the researcher should adopt the posture of a trusted agent in future studies. To bolster this approach another member of the research team attended several meetings at the early stages of the study. David Rippon was introduced to the management of the firm as a senior government advisor on ICT. The general issues of the firm were discussed informally to ensure a rapport with the management. The engagement of the senior management team with the research team enabled the researcher to establish overview understanding of the historical strategic development and possible future development path of the firm.

The study then moved onto a series of semi structured interviews that were conducted with the three most senior members of staff. The interviews provided detailed insight into the ICT history and strategic development path of the firm. These were combined with an examination of company documentation to gain

insight into the firm's internal and external business processing. Additional key informant inputs were also obtained. These were derived from personnel inside the company and from specialist optical publications.

Initial results revealed that the retail optical trade has evolved considerably since the company's formation. In the 1950s the practice of opticians was restricted by regulatory authorities and it was relatively easy to make money on the high street due to little competition and work from the NHS which provided a core income. As the market deregulated and high street franchises moved into the market competition has increased. The firm is now competing with large organizations that use sophisticated marketing techniques (TV, national press etc.). This has resulted in the market share that the firm enjoyed gradually diminishing. The firm is now facing restructuring and cutbacks for the first time in its history.

An important insight which was revealed in one key informant interview is the issue of VAT. The optical industry has a complex VAT structure. Several years ago HM Customs and Excise lost a court case with the optical industry and large amounts of VAT were returned. Many optical practices chose to invest this money back into their companies. The owners of this firm decided to take the refund as dividends. Many insiders within the company feel that this is where they started to lose the ability to compete in the market.

To address the decline in business the partners employed a marketing manager for the first time in the firm's history. The marketing manager's previous role was as regional marketing manager for a large chain of opticians. The partners felt that to bring in the marketing techniques used in larger firms may change the firm's fortunes. The partners gave the marketing manager a large budget and he employed a range of marketing methods to increase sales. He began a series of radio commercials and local newspaper adverts and revenue increased. The two partners were so pleased with the company's improved performance that they promoted the marketing manager to CEO. The previous general manager remained with the firm in a more junior position. The approach of the new CEO was that of greater investment in the firm to increase sales. He is optimistic about the firm's future and sees a role for small independent opticians in the high street. The new CEO implemented a range of ICT developments within the firm.

5.1.2. Case Study 3 ICT Development History

9 years ago the (now) CEO implemented an ICT system (Figure 11) that operates within each branch of the firm. The ICT systems primary aim and focus is on the management of patient records. Records and appointments are kept on workstations within each branch as well as records of stock and orders. They are stored in a local workstation database. The ICT systems were not integrated with sales activities. Till rolls were printed and manually checked against bank statements and purchase orders at head office. Data was manually sent to head office where all ordering of goods and services is undertaken. Using this system it is not possible to generate an integrated overall report of all the branches activities. Individual branch reports are printed and sent to head office. The data for all branches is then collated manually with the use of spreadsheets. The head office is the only branch with a Broadband connection to the internet. All other branches have a dial up connection. The firm purchased the ICT system and managed it themselves and only used support when they felt the need, which was infrequent.

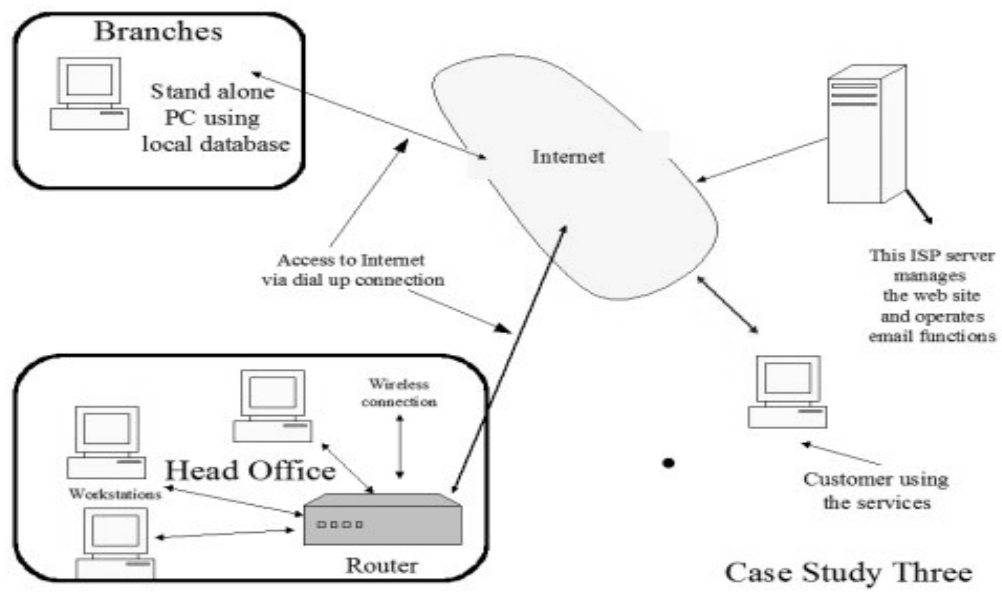


Figure 11 Case Study 3 ICT used prior to study

The firm's ICT relationship strategies are those detailed in the Table 10. The ICT system did not have an impact on the relationship strategies the firm used. The ICT system is not capable of any electronic communication with patients, suppliers or head office. Patient reminders for appointments were generated by the system and these were printed out and posted. Fax was used as a primary means of transmitting data to the head office for orders.

5.1.3. Phase 1 Case Study Facilitating Instrument: ICT web based application(s) utilized for PAR

To address the decline in sales the firm is seeking to increase its market penetration through regaining the sales it has lost to high street competitors. Without the large marketing budgets of major high street brands the firm is looking for new means of achieving this. Although the firm has a marketing budget, it has been greatly reduced due to a drop in the revenue the business generates. The CEO is adjusting his marketing strategies from having a large budget (as he had previously) to seeking the best value with a limited marketing budget. The firm promotes first class customer service within its marketing strategy. The firm feels that it has a good reputation for individual customer service which is not offered by large firms. Many of its customers have been with the firm for a number of years. Its strategic position with its customer base (actual and potential) is to offer individual first class customer service.

The firm's ICT was at Internet State 2 (publish) prior to the study. During interviews the CEO revealed that he is seeking to add e-commerce capabilities to the firm. The company has had a static web site for several years, which was written by one of its employees in their spare time. He decided that the look and feel of the site was outdated and did not reflect the firm as it seeks to position itself in the market place. Thus, the web site did not marry with the strategic development plans of the firm. It did not have any e-commerce capability and was written in HTML (hyper text mark up language) with no ability to alter or update the site without knowledge of specialist computer code. Adding e-commerce capabilities to the web site would provide additional sales opportunities. This could increase market penetration, thus fulfilling the strategic development aims of the firm. It was agreed that the researcher would provide e-commerce facilities. Training on the system would also be provided

and this would be with a senior member of the firm. This follows the premise of the research team that the learning and development relating to e-business needs to be with a senior member of the firm.

To facilitate the case study investigation the ICT architecture of the firm needed to evolve. The architecture utilized is shown in Figure 5. This was discussed with the senior management team. The researcher explained that the firm's email accounts and web hosting facilities would need to migrate to the E-business Development Platform (EBDP) in order for the study to proceed. This was agreed and the researcher assisted with the migration of the email accounts on the local workstations within the firm. In agreeing to move the ICT to the EBDP the senior management team had to adjust their strategic orientation in terms of existing equipment base and seize the strategic opportunities which the platform could offer. The researcher could then provide a Content Management System.

It was decided by the research team that configuration of the EBDP was not important for them to learn or go through as it is only done once and is a complex procedure. This involves the installation of a multi user operating system (Linux), a web server (Apache), to receive requests via the Internet from users. These multiple requests can be complex and are managed by an RDMS (relationship database management system) in this case MYSQL. The requests are then managed by a scripting language called PHP capable of interacting with the database and the web server and returning an output to the user in HTML. Once these are installed and configured to work together the Content Management System can be installed at the application layer and configured to work with each element thus creating one type of EBDP.

The researcher explained to the firm that a Content Management System allows users to update content easily without any specialist knowledge of computer coding. This gives the firm more freedom to manage the content as they see fit. It would give the firm a greater degree of control of their on line strategic marketing. The e-commerce facility was an additional plug in to the Content Management System and the outline framework was installed by the researcher. This gave the firm e-commerce capability. Relevant stock (sunglasses etc.) could now be uploaded to the on line

shop and goods purchased. The company has the ability to accept credit card purchases and this facility could be made available within the on line shop.

The firm's old site also contained optical information and this needed to be migrated to the new site. This allowed for the firm to provide free of charge, information on optical matters to the general public which was not provided by major high street retailers. They felt this was important and in keeping with the company strategy of offering added value to its customers.

A senior member of the firm was allotted time to develop the site and had an introductory days training on the Content Management System. This was followed by six further days of training and supervision. The initial elements of the training focused on migrating content from the old site to the new site. Development did not go well.

The first problem highlighted was importing content from the old site. The researcher instructed the user on how to do this but it was very difficult for the user to understand and manage. There were also problems creating menu structures and importing these menus from the old site. This was due to a lack of understanding of the management of the templates (the outlying structure) used for the overall design of the site. These could easily be changed with the required knowledge of the system which was demonstrated.

However after seven sessions the user felt frustrated and unable to grasp how the system worked. Although experienced in ICT for accounting and administration they were not used to working with web based systems. They had difficulty with the concept that the work done was not based on their workstation but located on the internet. This is a confirmation of the inductive logic supposition of the research team. This user felt that unless an application is based on the local workstation they do not "own it". The user of this system did become familiar with this concept but it was a hurdle to learning and development in the early stages.

The development of the systems was not going well and interest was waning. The researcher felt that if the user had not been given more assistance then study would probably have ceased for the following reasons. The Content Management System was too difficult for this user to configure and there seemed to be no return for the

time invested. A senior member of the firm's time had been taken up and there were little results to show for it.

5.1.4. Utilisation of the Research Team for PAR.

At this point a meeting with the research team was held to examine the progress of the case study. The team felt that although the firm wanted to move into e-commerce there were several hurdles hindering successful adoption. One concern was the learning and development of the user. The initial creation of a site was proving difficult despite a default system being installed. The configuration of the menu's structure and importing content from the old site was proving challenging. The research team felt that the learning and development that was required to manage the system was added to by these extra tasks which would not be present when the site was complete. It was agreed that the researcher should undertake the creation of the menu structure of the new system and the import of the information from the old site. This would allow the user to concentrate on the management of the e-commerce elements. This may assist the user and thus the firm to leap frog the early configuration issues and allow the user to engage in potentially more meaningful learning dialogues. The research team felt the learning and development capabilities and thus personal constructs of the user had been challenged by these issues and the study may have not continued if the researcher did not assist. They felt the user had several weeks to gain a competence in these matters and further longitudinal lapses would not gain any better results. The user was frustrated and this had become a hurdle to learning and development and thus e-business utilisation in the firm. This could have an impact on the firm's overall aim of achieving greater market penetration.

The research team then examined the issue of the template configuration and the visual appearance of the site. The look and feel of the site was felt to be important to the firm. The senior management team felt that visual appearance of the site was important to potential and current customers, stakeholders and rival companies. The research team then made the inductive logical supposition that if the site looked very modern and stylish then the firm's interest would be rekindled.

In undertaking this assessment the researcher used the academic research team as a base for his own learning and development. Through these discussions he was able to facilitate new methods deploying e-business within the firm. These overcame the hurdles to adoption that had been encountered *during* the research process.

5.1.5. Resumption of the Study

The researcher was working with a team of undergraduate designers who were asked if they would participate in the case study. They agreed. The firm's web site was designed by the graphic designers working with the researcher who visited the company and interviewed the directors. They along with the researcher gained insight into the visual identity the company wished to portray. They then examined the firm's competition in the high street and on the Internet.

Upon completing their research the designers provided several new designs for the web site and one was chosen by the CEO. This was very well received and new life was given to the project. The new design of the site gave the firm a new level of visual sophistication that they felt placed them alongside and equal to the large firms on the Internet.

They now felt that development of the site was also a development of the company overall and they could now use the Content Management System as a means of leading the company's strategic development in terms of image and market presence. They hoped that this would generate sales via the web site. They felt that the incorporation of the old sites information on optical matters and a new sophisticated look would ensure that the e-commerce systems were of an appropriate standard for customers to make purchases. This would be bolstered with the knowledge that the firm had a good reputation for customer service. They now had the potential of a web system that was in line with strategic development aims of market penetration and their niche offering of outstanding personal customer service.

The user of the system who had previously been involved resumed work on the site. The task now was to upload a range of products. The user though felt that they had spent enough time on the site and did not want to continue due to the day to day commitments they had within the firm. They were also concerned about the

configuration of the payment system which they considered to be very important. The senior managers met and felt the system was of value but they did not have the skills or the time to complete the site. They asked the researcher if he was willing to complete the systems and they would then manage the day to day operations of the e-commerce facilities. This was agreed and the site was completed successfully. The firm now had operational e-commerce facilities.

There were several other key developments within the firm at this stage. The company was being bought from the old partners by the CEO and negotiations were protracted and difficult. The head office of the company was located in a branch that was to be closed down due to lack of trade. This would have a major impact on the working practices of the company. The accounts department, spectacle and lens production as well as the CEO's office are all located in this branch. This was now to change if the buy out was successful with all three going to different locations.

In a meeting with the CEO the researcher was asked about how the senior management team could access documents securely via the internet. Previously they had uploaded product data sheets and knew files could be stored on the web site. This new knowledge led the CEO to ask the researcher about how this could be achieved for internal collaboration. As the firm's operations were now to be broken up and going to different locations, they wished to be able to access documents remotely. This would allow them to consolidate their new position when operational matters were not in one single location. The researcher created document storage facility on the Content Management System. This allowed senior personnel to access documents securely by logging into the "front end" of the web site. These documents were only viewable by senior managers within the firm.

5.2. Case Study 3 Phase 2

The further development of Case Study 3 builds the use of the Content Management System and document storage systems implemented in phase 1. A year later and the CEO has bought the firm with a new partner and it is under their management. They are now seeking to consolidate the new firm's position. The new owners do not have the financial resources of the previous owners and they are now examining how ICT

can save costs by reducing paperwork and processes. Strategic development aims are now being focused on how the firm operates internally.

The new owners are incorporating their learning and development of ICT from phase 1 into their personal constructs and then using this knowledge to re-examine the current processes within the firm. The use of the ICT provision implemented in phase 1 of the study demonstrated to the senior management team that collaborative tools and central data storage were beneficial for their business. They use this facility to work on group documents that can be easily updated. The use of these provided “real time” collaborative tools.

At this stage the amount of information available to them in “real time” is limited. As previously stated, data about sales, staff performance and stock is undertaken manually in each branch and sent on paper to head office where it is collated. This creates a lull in information being at hand to senior staff, making reporting procedures slow and cumbersome.

The business is not as successful as it had been several years ago. Thus, it is now even more important to know if each branch is trading at a profit. The management are now seeking to use ICT to consolidate the firm’s position. The new owners also felt that e-business technology may provide a richer source of information when undertaking strategic development. Based on the knowledge that the collaborative document storage facility had improved the information to the senior management team they undertook an investigation to find out how ICT could be further utilized. The senior managers felt that the access to “real time” information would allow them to make more informed decisions. This capability could assist the firm in making effective strategic decisions and offer the potential to realign strategies at an earlier stage in any development process.

As part of a strategic learning process the CEO examined the optical press and undertook web based research. Quotes were obtained by several firms that managed software for optical practices. The final choice was a company that implemented ASP solution to the whole company. At this time Broadband was only installed at head office. To implement the system it was then installed at all branches. The new

system was rolled out in stages, at only two branches initially with the rest following after trials were completed.

The system operates in the following way (detailed in Figure 12). Previously in each branch there had been a local database. This contained appointments, patient records, stock, etc. This data was migrated from each branch into one central database located at the software company's head office in York and accessed via the internet. This was done via a secure internet link.

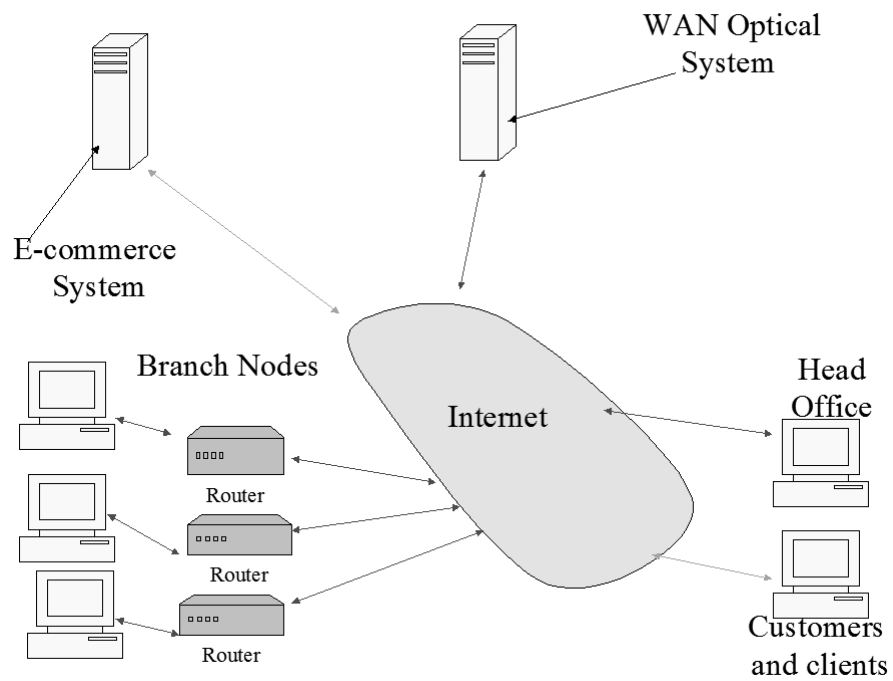


Figure 12 Case Study 3 New ICT Optical System

ICT used for data gathering, collation and processing (internally)	
Post Phase 1	Post Phase 2
E-commerce systems. On line CRM database remote document storage for senior personnel	Sales records Stock records Patient reports

Table 16 Case Study 3 Post Phase 2 data gathering and processing

Table 17 shows the new e-business processes created after phase 1 and 2 ICT deployment. The new system enabled head office to see in “real time” sales and stock in each branch as well as patient appointments. The information could now be collated to create one report for all branches, thus saving considerable work at head office in generating these reports.

The system was installed in all branches and completed by June 2007. This roll out period took nearly a year. There were several problems with the deployment and management of the new system. Importantly, the decisions about the optical system installed in phase 2 were made by the new owners without consulting the financial administrator. The new system was presented to her as an installation in one of the branches for a trial. This was the first time that she had any knowledge of the system. The new owners of the company had not considered the financial administrator’s role in the implementation of the new system. A meeting was then held between the new owners and the financial administrator to discuss the firm’s new ICT developments. The meeting highlighted several key areas for concern:

1. ICT Integration

The new owners of the firm had purchased and were about to fully deploy a new ICT system without considering how this would impact upon the current ICT within the firm. There was not a holistic overarching ICT strategy. There was no integration with the e-commerce system that was already in place. A lack of awareness and knowledge by the new owners on how or if this could be integrated into the new optical system meant this was not fully considered and thus the possibilities not examined. This was then discussed. The new owners decided they were proceeding with the new optical system as they had committed to purchase. They then considered the e-commerce system and decided they did not want the new systems to

manage e-commerce (which it was capable of) because they felt that it was better to have two ICT suppliers, a common supplier practice.

It may have been more productive to ask the current ICT enabler (the researcher) to liaise with the new ICT supplier and from this a new integrated system could have been developed that was more efficient. The improved efficiency could be through data flow and management as well as integrated stock control systems. The e-commerce system could have been a “virtual branch” and integrated with the optical system.

To achieve this, the new owners would need to be aware of what was possible. Their personal constructs had developed and been influenced by the work done in phase 1 and they saw value in ICT, but they did not know enough about the possibilities to make fully informed decisions. Collaboration between the researcher and the new ICT provider could have made the systems more compatible but this type of collaboration is not common in the commercial world. The researcher was also unaware that the new owners were seeking new ICT development at this stage.

2. Management of Financial Information and Data Control

The financial administrator asked the two senior partners how the systems managed and reported financial data and information. They could not answer the questions raised. They conceded they had not considered the impact of her role in implementation of the system. Once aware of this they felt this was a grave error as the one of primary role of the new system was financial management and reporting.

The senior partners asked the financial administrator to undertake an investigation into the reporting capabilities of the system to see if they married with current reporting practices and if not how they could be integrated. She visited the software company to determine this. The results of this visit demonstrated that her working practices would need to change and develop to adapt to the new system.

This is perhaps the most important consideration that was overlooked by the new owners. They purchased a system to enable financial and sales reporting and did not include the financial administrator’s views on the system. They conceded this was a grave error. There was a lack of a holistic analysis, involving strategic planning and

awareness of how this ICT would change working practices within the firm. They had failed to see the value of consulting the financial administrator of the firm who managed the finances on a day to day basis.

This may be due to the fact that the ICT impacted upon working practices within the organization in ways they did not foresee due to a lack of knowledge of the system and what its capabilities were. ICT can change working practices through a more efficient collation and management of data and reporting and this was not part of previous working practices within this firm using e-business systems. Only after it was installed did the situation arise and was rectified.

There may be other reasons why she was not consulted. Under the previous owners she was a director of the firm. With the new owners her role was reduced to that of an employee. The new owners may have wanted to “go their own way” and not behave in ways that the old firm did. Whatever the cause, the exclusion of the financial administrator had a severe impact on the successful implementation of ICT and e-business, because crucial elements of the decision making and development processes were overlooked.

The financial administrator also pointed out that if the software controlled all of the company’s data at an external location then the company could become dependent and “locked in” with them. She asked how they could get their data back if they chose to move suppliers. The firm’s data was now stored in the new supplier’s systems located in York. The new owners could not answer this question and thought this was very important. They immediately questioned the ICT supplier who replied that it could be done, but they only supplied this information when asked.

3. Deployment and Security

The staff in the branches reported that more training was needed on the new system as they only had 0.5 days to learn the system which was done in normal working hours and on a live system. The new owners had not fully considered the change in working practices this implementation had across the organization, and the impact upon staff.

The financial administrator also raised concerns about ICT security and how the sensitive data the company stored was managed. The senior partners once aware of the issue were also concerned. They also realised that they did not have the ICT skills to understand the issues. They decided to send her on an ICT security course to gain an understanding of the basic principles of ICT security. Following a successful completion of the ICT security programme she visited the software company to determine their ICT security policies and practices. After examination she felt satisfied with the security procedures in the software company and the way they deployed ICT security within the firm.

Additionally upon completion of the course the financial administrator removed all the payroll information from the workstation connected to the Internet that was used at head office. This was kept in a secure physical location when not in use. She had changed her working practices and the company's due to exposure of and learning about ICT considerations when dealing with ICT security. Her knowledge and therefore her personal constructs had evolved and as a consequence changed her working practices.

The financial administrator also recommended that the company should keep a separate Internet connection at head office and not become solely dependant on one company, (the new ICT supplier also supplied the Internet connections for the branches). This was agreed by the new owners.

5.3. Analysis and Evaluation

The historical background to this case study, which places it in perspective with its competition in the optical industry, is important. The firm's senior employees feel that the old owners did not reinvest the money reaped from the VAT refund. This placed them at a disadvantage in the industry as rivals did invest. This may or may not be the case but was certainly felt by the senior management. They also had a record of diminishing investment in the company structure. The two previous owners of the firm may have realised this error and employed the marketing manager with a large budget to address this. He also developed the company's ICT systems (but not training) by having a database system for keeping patient records but this was not accessible outside of each branch. The CEO implemented this ICT within the firm at

a time prior to widespread Broadband availability so it may be the case that this system was the most viable at that time.

As Broadband became available the options for the firm widened and resulted in the development of e-commerce. However in phase 1 the study has shown that despite efforts to manage e-business development within the firm the end result remained elusive without the intervention of the researcher to complete the system. This may be due to the historical lack of training in ICT within the company. E-commerce learning and development may be too far removed from the company to be attained easily.

Thus, the firm did not have the ICT skills to develop e-business applications. This was demonstrated by the frustration felt during the site's construction stage. They would have liked to develop the systems in house but were concerned by matters of security when dealing with on line financial transactions. The trusted agent relationship of the ICT provider (the researcher) enabled the successful development of these complex transactions without undue concern by the senior management team in phase 1.

This firm has made considerable advances in ICT. In implementing the Content Management System with e-commerce that it facilitates this firm has moved from Internet State 2 (publish) to Internet State 3 (transact). It is now possible to buy goods from the company on line.

The advance to e-commerce from a “static” information site impacts on the relationships of the firm. The firm has developed new reach with its customers (potential and actual).

The use of the Content Management System and its plug ins allow the firm to communicate with its customers via electronic means. Newsletters can be sent out from the site and updates on the web site can now be undertaken by the firm. They now have the e-commerce web site acting as another on line “branch” and now have a wider range of options in achieving market penetration with the addition of online sales and marketing. If they incorporate the e-business systems into the strategic development process when communicating and selling to customers (potential and actual), they will have new means of achieving their strategic development aims.

Location of ICT services at the end of Phase 2	Type of ICT support	Additional ICT Relationship Strategies at the end of the study
ASP, ISP and in house	ASP.	CRM newsletters, news updates on web site. Patient reminders sent via system

Table 17 Case Study 3 ICT location and relationship strategies at the end of Phase 2

The optical systems, implemented in phase 2 also add to the relationship strategies of the firm. They provide electronic automated patient reminders of appointments and are capable of far greater data capture.

The literature proffers that the use of e-commerce systems will have a far greater chance of success if the brand were already established. This company has a good county wide reputation for its goods and services and thus with a marketing strategy has a good chance of success in e-commerce. Now the new site is developed a key employee manages e-commerce. This is being done at a senior level thus reflecting how the company views ICT and e-business.

As their market sector is becoming more competitive smaller players need to diversify in their reach and levels of service to stay competitive. E-commerce systems have a role to play in this firm by creating an on line presence that provides the additional information that the firm displayed in its old site whilst incorporating on-line sales, creating a niche that the major high street retailers cannot serve easily.

The strategic development processes within the firm were influenced by the ICT developed in phase 1. This was triggered by the Content Management System training and development with a senior member of the firm. The discussions that followed within the senior management team about the Content Management System and its potential changed their perception of e-business capabilities. This enabled a new working procedure. They could now share documents on line and felt this had more value to them than an exchange of documents via email services. The documents were at a fixed point on the Internet and access to email (often only configured on one workstation in this study) was not required to access documents. This represents a step change in working practices of the senior members of the firm and was very well received. This shift in the learning and development of the

managers of where information can be stored and accessed is important because of the impact it had on personal constructs of senior managers. In this study we now have a situation where the managers now see the value of remote access to information and data. The learning and development of the firm's senior staff in phase 1 of the work laid the foundations for phase 2. This learning and development had an impact on the strategic development path of the firm as a whole. It allowed for the development of ICT in phase 2 through the inclusion of this knowledge in the strategic development processes.

The new owners in phase 2 decided to go "their own way". Case study records and interviews showed that when the previous senior management team purchased financial software and applications this was done in tandem with the financial administrator and the firm's accountant. In the purchase of the optical system neither party were asked for their views. A difference is emerging between the old owners of the firm and the new ones. The strategic decision making and development process in the old firm involved the financial administrator in ICT purchasing when it would have an impact upon her working practices. This was not considered by the new owners. The new owners did not consider the ICT as a direct part of the financial operation despite purchasing the system to enable more accurate and up to date financial reporting.

Despite these setbacks the use of ICT was implemented across the organization. By the end of the study the company had reached Stone's Internet State 4 (integrate internally). The data from all branches is now fully integrated with head office.

5.3.1. The nature, form and sources of enablers and constraints to e-business development within the study

The new CEO had a positive view of ICT and how it could help the firm. He had a history of investment in ICT infrastructure. This experience gave him some knowledge of what could be achieved by ICT and he was willing to seek new ways to improve the firm's fortunes. His personal constructs were open to ICT development. He did this by expanding into e-commerce (Internet State 3) and then by using the optical system (Internet State 4) to manage the firm's internal processes.

The firm though has a poor history of ICT training and this was a hurdle to ICT development. This was one of several hurdles that needed to be overcome for the successful implementation of the e-commerce site and therefore the growth of e-business within the firm. In phase 1 the initial installation of the Content Management System on the server was undertaken by the researcher. However the creation of the menu structures and the importing of information from the old site were stumbling blocks in the site's development. The learning and development that was needed to undertake these tasks was challenging to the user. This learning and development came at a time when the system was still new to the user and as such the learning and development opportunities of the user were being challenged in several areas at once. This made learning difficult due to a possible "information overload" of the user's personal constructs. This may have created a fear of the system thus hindering learning and development opportunities. The research team attempted to resolve this problem as discussed within the study utilising the dynamic nature of the methodology.

A key area of positive e-business development was the presentation of the designs for the web site by the graphic designers. This represented a turning point for the company in the development of the site. They saw this as a major development of the system. The functionality of the site was the same as the site with the old design but the managers felt the new site was "better". This was due to the image the new site created.

The design had a direct impact upon the relationship strategies the managers felt the firm could now utilize. The design conveyed a new modern image and this was in keeping with the strategies and development plans of the CEO in seeking market penetration. The new design conveyed a new level of ICT sophistication. Importantly the senior managers viewed the design of the ICT system above its function. They were not capable of examining the system in terms of its functions due to a lack of knowledge. They relied upon the researcher as the ICT provider to ensure these functions were in place. They became actively involved in the decision making and development process when design matters were discussed. This is where they had something to contribute and could become involved. The new design not only

triggered new interest but also had a wider impact on the perception of e-business in the senior management team.

It is possible through good design to have an image that rivals large organizations. The new design is visible to potential customers and to other rival companies. This motivated the senior managers to proceed. They viewed the design of the site as development of their relationship strategies with customers, suppliers and competitors. The new modern design gave the company a professional image that senior managers wanted to convey about the firm. This was in keeping with the strategic development plans of the firm.

The firm wanted to complete the site but did not have the time or the willingness to go through the learning and development required to develop the site themselves. They clearly saw the value of the e-commerce but were hesitant to complete the site without professional guidance. This was offered but the responsibility of the task was seen as too daunting. They realised that they did not have the required skills to complete the development of the site via the skill set within the firm even with training. They chose to adopt the e-business system by engaging the researcher to complete the project. Though they had not completed the site themselves the level of ICT awareness within the firm evolved through exposure to the potential of e-business systems. The documentation storage facilities had impacted upon the strategies and development processes of the firm. This had changed the working practices of the senior management team, and this influenced the future direction of the firm and led to phase 2 of the study.

In phase 2 the management team undertook a complex ICT development programme. In developing and deploying the new optical system the implications were not fully understood by the CEO. Decisions on ICT deployment were made without fully considering the business processes that were currently in use. The strategic decision making and development process of the CEO also did not consider the current working practices of the firm. The financial administrator's working practices were also not considered. This may be due to the fact that the CEO did not involve himself in the daily financial management of the business except to read reports. This lack of understanding of the day to day financial management of the firm meant he was not in a position to fully understand the impact of the new system. He had to adjust the

working practices within the senior team to adapt to the new system. This could have been achieved with the co-operation of the financial administrator prior to deployment.

In phase 1 we see a firm evolving their working practices with an understanding and development of ICT. The ICT implementation was guided by the researcher acting as a trusted agent. In phase 2 a change in working practices was imposed upon the firm via ICT development. This ICT was implemented by a commercial firm selling a product without raising awareness of the changes and impact that will occur. There were changes in working practices at every branch. Any change in working practices may be challenging to staff and this could have been managed with better training and awareness.

Any new ICT system has the potential to impact upon and change working practices. This was not considered by the CEO in phase 2. He attempted to gain the benefits of e-business but had not fully considered how it was going to impact the working practices of those within the organization. He did implement training sessions within each branch on the new system but this was not considered upon purchase and roll out. These factors demonstrate that the CEO had not considered the full impact of the implementation of the systems prior to installation. This meant that the system was not as fully utilized as it could have been in the early stages. The failure to consider the impact on the working practices during the strategic development process created problems. He had not fully considered within the strategic development process what impact the ICT systems may have on the firm. This could have been managed more effectively by either consulting the financial administrator, the researcher or the software company that installed the system. It was only after the firm had trained some of its own staff on the system that it became fully aware of the implications of what it was undertaking. The ICT provider could also have managed this change more effectively by making the CEO aware of the cultural shift that would have to occur in the organization.

This may be best achieved by the e-business provider becoming involved in the strategic development processes within the firm. The ICT provider in phase 2 was selling a commercial product, and therefore was seated in the customer supply chain. This meant that the provider was unable to take advantage of being a trusted agent

within the firm's extended enterprise. Had they been a trusted agent they could have highlighted the impact that the new systems would have in a manner that was better understood by the CEO of the firm. A trust based dialogue could have enabled these issues, and thus the systems, to be understood and the transition to them made easier. This may not have been undertaken by the e-business provider because it felt it may have hindered the sale. Highlighting these issues may make the sales cycle more difficult to achieve. This emphasises that the relationship that the e-business provider has with the small firm, as a trusted agent needs to be established prior to the sale or implementation of e-business. Trust and a dialogue with the firm's owner manager needs to be created first. Doing this may allow the e-business provider to be included in the strategic decision making and development processes within a firm. This may have overcome some of the problems in phase 2 implementation and deployment.

The new owners had not considered ICT security until it was mentioned by the financial administrator. In phase 1 the security of the Content Management System was assumed and not considered in detail by the senior management. The researcher in attempting to gain an understanding of the wider issues involved within the study engendered trust and thus security implications were not raised other than at an operational level within the firm. It may also be that the extent of understanding within the personal constructs of the senior managers did not even trigger consideration that the systems were not secure, though they were certainly aware of ICT security on the workstations within the branches. The financial administrator who was involved in phase 1 raised the security concerns in phase 2 and resolved them.

There may be contextual specific reasons for this. The new owners may not have wanted to ask a previous director of the company for advice even though she remained as an employee. The history of her being a director of the old company and not of the new one meant that the decision making processes were not within her current boundaries of authority and responsibility. Thus the new CEO may simply have wanted to go his own way and not follow the patterns of the old firm and excluded her deliberately. She could not therefore bring her past experience in e-business in phase 1 to bear because she was not asked to do so. The fact that the CEO

excluded her from the strategic decision making process when undertaking the ICT development in phase 2 meant the company isolated the skills within their own organization. The researcher was also excluded from the early stages of the phase 2 development. The financial administrator's personal relationship with the researcher may have facilitated the researcher's exclusion.

This firm has evolved its ICT capability considerably over 2 years. The new access to data information and sales has enabled the company to be far more effective in its report generation about branch activities. ICT now facilitates effective reporting procedures within the firm and wider strategic development processes. The new owners can now include up to date "real time" information about the firm when undertaking strategic planning. This gives the firm the potential to react quicker to changes in its external environment. The inclusion of ICT within the strategic development processes of the firm allows the new owners to utilize a variety of ICT tools to achieve its strategic aims.

To adopt this new ICT the firm adopted new working practices. It now has a wider market reach and a more efficient stock management and control system. Management of patient records and communication is now undertaken by ICT reducing costs and increasing efficiency.

The retail sector is becoming more and more competitive and Internet based ICT has been in use by large retailers for some time. To stay competitive within the market place the study findings reveal that ICT was vital in keeping up with current developments in the sector. At the end of this study this business has made considerable advances in ICT which keep it on par with other high street retailers in the sector. E-business functions at Internet State 3 and 4 have also enabled the firm to enhance its strategic development processes, internally and externally and bolster the firm's relationship strategies.

5.3.2. Commonalties, Differences and Trends

Although this is the first study that was completed it is possible to examine some commonalties, differences and trends with the previous uncompleted studies.

In Case Study 1 the researcher was viewed as being in the customer supply chain and this hindered learning and development dialogues. In Case Study 2 the researcher did not deal with a senior member of the firm and again learning and development dialogues were missed. In Case Study 2 this was compounded by the possible fear the senior partner had in discussing ICT. He also attempted to incorporate the skills of the researcher into a new firm. Neither Case Study 1 or 2 incorporated e-business into their strategic planning processes.

The results from Case Study 3 are different. This may be due to the posture of a trusted agent the researcher held from the outset of the study. The fact a senior member of staff was dedicated in case study 3 enabled this study to have a “top down” approach to the implementation of e-business within the firm. The impact of the documentation sharing systems began and developed from a senior level. This led on to the successful e-business implementation that was independent of the researcher. However the development path was not smooth and errors were made during the strategic development process.

This demonstrates that e-business deployment should be given consideration during the strategic development processes within a firm. This can only be effectively achieved if there is awareness in the firm of the potential impact that the evolution of e-business will have on the firm as a whole. An e-business enabler can assist with this via a trusted relationship. This may allow for the personal constructs of the owner managers to be fluid and allow for a dynamic e-business development path.

And it may assist owner managers to account for the impact ICT development may have on the firm and its relationships. This needs to be managed by the e-business enabler and the owner managers of the firm working in partnership to achieve the best results. The e-business providers relationship with senior figures in the firm is crucial in understanding what is happening in terms of the impact e-business can have on the company as a whole. This holistic approach is based on the ICT enabler being a trusted agent. This in turn will help the senior manager via learning and development dialogues to adjust their personal constructs facilitated by an ongoing long term relationship. Once this has been successfully developed then the full benefits of e-business may be utilized within the strategic planning processes of the firm and in wider areas.

6. Case Study Four

6.1. Introduction

This case study focuses on e-business development within a micro firm. In this study three distinct areas of e-business development were attempted. Only e-business at Internet State 2 (publish) was achieved successfully. The study highlights how the owner manager proceeded to develop e-business within the boundaries of his personal constructs. When the limits of his personal constructs were reached he diversified into areas of e-business he understood. Thus it raises important questions for the researcher and use of the EBDP in facilitating e-business. It also emphasises the need for understanding and managing the strategic planning and development processes of the owner manager in relation to e-business deployment. It concludes with the notion that e-business above Internet State 2 (publish) can be reliant upon “real world” relationships to fully engage all participants.

6.1.1. Overview

This is the first case study that has been undertaken outside of the UK. It involves a sole trader who teaches English to German nationals. He is an English national who settled in Germany 20 years ago. It is important within this study to give a brief resume of the owner manager. This provides informing insight for subsequent examining of the firm’s development activities when seeking to utilize e-business.

The owner manager was a chef He has owned and run businesses. Having become disillusioned with the catering industry he has trained as an English teacher. He has recently started a teaching business after qualifying. Whilst this business is getting established the owner manager makes his living via various means. He is also a hill walker and he offers guided walking tours in the area.

6.1.2. Background and Development of the Study

To gain a depth of insight into the firm, its history and contextual position face to face semi structured interviews were undertaken with the owner manager. These revealed that he is seeking to develop a business in which his skills as an English

teacher earn him a living. He has no ambitions to develop the teaching business beyond being a sole trader. His strategic development aim is to move from catering to teaching as his primary source of income. The strategic development aims of the owner manager are a combination of his personal and professional development ambitions. To achieve his teaching qualification he undertook a course in English in the UK. This was for several reasons. He felt that the academic qualification he would receive in the UK has a higher standing than one obtained in Germany

6.1.3. ICT provision prior to study

As this was a start up firm in its first year it had some documentation but this was still being developed. ICT procedures and processes were also in their infancy. The owner manager has some experience of ICT through his previous employment. He had a high speed internet connection and he takes pride in having the latest software operating systems and hardware. In the past he has built and developed some basic web sites as a hobby. He has never used any form of ICT consultancy in any of his businesses. He was keen to use his ICT skills in his new business. The relationship strategies he employed (Table 19) were based on ICT managed on his local workstation. He uses fax, email and telephone as his primary means of communication and marketing with clients (potential and actual). The ICT network infrastructure in this region of Germany is well developed and is very similar to that of the UK.

Location of ICT services at outset of study	Type of ICT support	ICT Relationship Strategies at the outset of the study
ISP and in house	No ongoing support – hardware and software purchased by owner manager.	Telephone; facsimile; mobile telephone; PC; Internet; electronic mail;

Table 18 Case Study 4 ICT location and relationship strategies at the outset of the studies

The teacher instructs his students individually from an office at his home. He does give some lessons in clients' work environments but most of his teaching was undertaken in his office.

The interviews with the owner manager revealed several important issues. At a very early stage in the firm's development the owner manager felt that the strategic development aims of the business were not being achieved. He identified during his strategic assessment processes several key areas where his business was not developing in line with his overall strategic aims. He identified several factors that were stopping the successful growth of his business, these were:

Market Reach

He was concerned about the lack of marketing his business suffered and associate inability to reach out to a potential customer base. He advertised in local press but the economic restraints on his business were such that the advertisements were small and infrequent. He was keen to examine and develop e-business applications that could help with the marketing of the business.

Teaching Infrastructure

He was also interested in how e-business applications could assist with his teaching practice. All of his clients require their own means of transport to attend lessons in his home which is in a remote location. The individual nature of the lessons also meant that students did not have the opportunity to engage with other students and practice English together as a group. The owner manager felt the remote location of his office and the individual nature of his teaching sessions were a hindrance to development of his business. Teaching to groups of students could increase his income.

In discussions with the researcher the owner manager sought to use e-business to achieve his strategic development aims. He wished through ICT provision to increase the number of students he had by utilising e-business tools. E-business tools could facilitate and enrich his relationship with students (potential and actual) and also improve his marketing reach.

6.2. Phase 1 Case Study Facilitating Instrument: ICT web based application(s) utilized for Participatory Action Research

Internet State prior to ICT PAR	Tapscott theme	ICT used for study
1 access	Virtualisation	CMS - Virtual Learning Environment

Table 19 Case Study 4 ICT web based application(s) utilized for Participatory Action Research in Phase 1

The researcher met with the research team to discuss which e-business tools would be best suited to the study. These ideas were then presented to the owner manager which addressed his concerns in the areas of market reach and teaching infrastructure.

6.2.1. Market Reach

A Content Management System would be the most appropriate e-business vehicle for achieving his marketing aims. This was agreed. The installation and configuration procedures were the same as those in Case Study 3. The researcher and the research team felt that as the owner manager had previous experience with web based systems, the problems of the understanding the location of services which had been a stumbling block in Case Study 3 may not occur.

The team also felt that to introduce a new design template early in the case study would create a positive development environment for the owner manager. The researcher in conjunction with the owner manager chose the design template as the first task after the initial installation. Once again this was very well received. He felt the new design reflected well on his firm. One of the owner manager's strategic development aims had been achieved. When viewing the website the firm had a look and feel of a professional business. This increased his marketing capabilities.

The Content Management System was also capable of multi lingual facilities. The owner manager provided the content for the site in English and in German and with basic training placed the content on the site successfully. This was undertaken to

address the needs of current and future students/customers. The site offered an effective way to achieve multi lingual capabilities for the firm within a tight budget.

6.2.2. Teaching Infrastructure

The study then moved on to addressing the owner manager's e-business needs relating to his teaching practice. It was decided by the research team that the most appropriate vehicle for this was a Virtual Learning Environment. The owner manager agreed and the researcher installed the Virtual Learning Environment and undertook the basic configuration of the system. This was done on two separate visits to Germany and subsequently on line.

The Virtual Learning Environment installation is very similar to that of the Content Management System. The differing functionality offered by the Virtual Learning Environment is based within the application and not within the operating system, database or web server. The EBDP is capable of facilitating a wide range of needs. The primary difference is at the application layer where the functions offered may differ. This enables the EBDP to be flexible and offer different services to those needed in Case Study 3. It can achieve this whilst remaining seated within the PAR elements of the platform.

Following discussions with the owner manager the researcher when configuring the Virtual Learning Environment enabled certain elements to be restricted so that only registered users could access areas and needed to be enrolled on a course for content to be seen. The owner manager felt that a public display of certain elements of the Virtual Learning Environment system enhanced his on-line presence as potential clients and rival firms would be aware of him using sophisticated ICT in his business. This was in keeping with his strategic development aims of having a professional business presence. The Virtual Learning Environment can facilitate course materials, on line tests and student submissions. The addition of courses, notes and other learning materials was left to the teacher as this is the core skills of the business though training on how this is achieved was given.

Finally the Virtual Learning Environment was integrated with the Content Management System so that to the end users of the system the applications appeared

to be one system. This was achieved by the researcher modifying the design templates of the system to create a seamless e-business application. The combination of these e-business applications addressed the needs raised by the owner manager during the research.

6.2.3. Case Study 4 Research Progress

The researcher returned to Germany six months later to assess the progress of the case study. The owner manager stated he found the Content Management System very useful for achieving his aims of market reach. However he had very little success with the Virtual Learning Environment, which he was displeased about. He viewed the deployment of the Virtual Learning Environment as a failure. Although he had promoted the Virtual Learning Environment to his students none of them had used it more than once.

The researcher attempted to find out why and proceeded to examine the Virtual Learning Environment and found that the main message on the front page of the site asked potential students what they would like to see as content.

The researcher felt this was a poor approach as it seemed to reflect the fact that he had no real idea what to do with the system. The researcher questioned the teacher about this and he replied that he was waiting for ideas from his students. Deeper investigation revealed that the teacher had no teaching materials on the system.

He explained that he viewed his style and method of teaching as reactive in the sense that his students come to him with a need to learn English for a purpose. He had no formal written teaching plans for his lessons and reacted to the needs of students as they presented them. For example they may have come to him to learn English for a business trip. He would then engage with them verbally on that topic to develop their English. He did utilize some written exercises with students and could have incorporated this material into the Virtual Learning Environment but the owner manager had not thought to do this.

His personal constructs at this stage may have been limited and resulted in lack of ability to structure a course which, in turn, was compounded by the specialist nature

of the e-business application which needed this structure. He chose not to address this need and therefore he viewed the Virtual Learning Environment as being unsuitable. This lack of understanding by the owner manager may have been a contributing factor to the Virtual Learning Environment's failure.

The owner manager felt that the Content Management System was a success in increasing his aims of market reach and in bolstering his on-line relationship strategies. However the Virtual Learning Environment had failed to serve his needs. For him it had not addressed his strategic development aim of increasing the quality of student's experience or allowed him to work and deliver teaching to groups of on line students.

6.3. Case Study 4 Phase 2

Despite these setbacks the owner manager's confidence in using the Content Management System meant he was happy to continue with the case study. He could not use the Virtual Learning Environment effectively but had used the Content Management System to achieve his strategic development aims via an enhanced marketing strategy. These skills had now become part of his strategic development processes. He now sought to use his new skills and learning of the Content Management System in assisting the development of a new business idea.

6.4. Phase 2 Case Study Facilitating Instrument: ICT web based application(s) utilized for Participatory Action Research

The owner manager makes his living from various sources. He also offers guided walks. Having seen the success of the Content Management System in promoting awareness of his teaching business he approached the researcher with the following idea. He thought that a good business could be developed by advertising German walking holidays in the UK. Users could choose a range of accommodation in the local area according to their wishes. He felt that if they could choose and book the type of hotel on line in conjunction with the type of walks they wanted he could increase his trade. He would also provide transport to and from the airport.

In phase 2 of the study we have firms potentially working in collaboration. This involves the attempted creation of a hub of businesses. End users can book

accommodation via the internet and this is passed on to each firm accordingly. To do this the user must book a walking trip. The business premise is that extra revenue will be gained by the firm providing the guided walks and thus gain customers he would not have had previously. Therefore the key firm is the owner manager of the walking trips which will always gain trade which ever trip is booked. The flow of information is shown in the Figure 13.

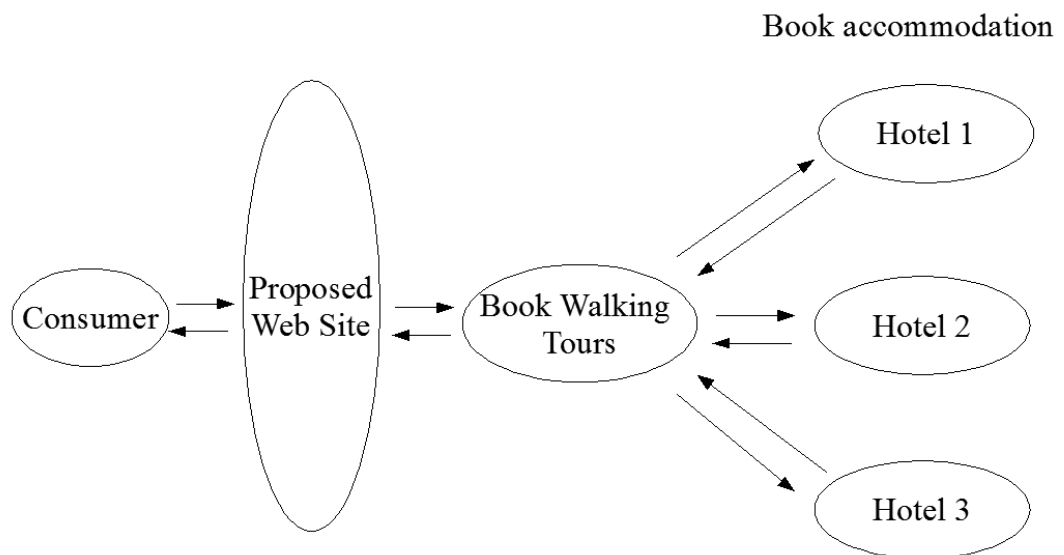


Figure 13 Phase 2 Case Study 4 Proposed New ICT Systems

This type of collaboration of firms is described by Gray (2003) as a hub. This is where one firm is the focal point. In this hub we see that the firm providing the walking tours is the focal point. No trip can be booked without a walking trip. The hotels involved do not pay for the service of the site. The firm providing the walking tours also will provide (chargeable) transport to and from the airports for groups and individuals staying in the region.

The owner manager is providing a new level of sophistication in e-business complexity in creating the hub. There is an integration of e-business provision for the booking of rooms and walking tours. The presence of the researcher as an ICT provider enabled the participant firms to be involved in the more complex Internet States, in this case Internet State 3 (transact), without changing their current ICT structure through the use of the hub. This would only be achievable with the researcher acting as the e-business provider and thus removing the cost constraints from the project.

This hub uses e-business systems that could enhance the revenue of all the participants. It allows for the development of new revenue streams within each firm whilst each maintains its independence. The owner manager's qualification as a hill guide was coupled with his knowledge that e-business could be utilized as an information and marketing portal. His concept then developed into bringing together a range of firms via the Internet to achieve his new business idea.

There has been a shift in his personal constructs that allows owner manager consideration of strategic development processes that are facilitated by e-business. The owner manager's understanding of e-business had further developed in terms of his relationship strategies. By bringing in other firms he attempted the creation of on line relationships with other firms via the hub. His strategic development processes now included an attempt to use e-business relationship strategies that were outside of his firm.

This project was not completed. There were several important incidents, which hindered the development of the project. During the development stages the researcher was to meet with the other participant firms on visits to Germany.

During the first visit in phase 2 it was clear that successful development of the system was constrained because the owner manager had not done the required work. He had not established any relationships with the other firms to achieve the integration of these firms within the new hub.

The researcher and the owner manager then attempted to progress the project by focusing efforts on the owner manager elements of the hub. It was hoped that by providing a demonstration system other firms would be attracted to the project. To achieve this, the costs of the walking trips needed to be included within the system. When the researcher asked for the pricing of the walking trips these were not provided. The researcher asked for this information on several occasions and subsequently upon returning to the UK. Without this information it was impossible to structure a price for a holiday that included the guided walking tours and accommodation. Therefore the economic viability of the business could not be assessed. Pricing of the walking trips and the accommodation together was a key element of the proposed hub. Without this information it was not possible to offer the system to end users or to determine if the other participants in the hub (the hotels) felt the system was economically viable.

These factors made the study very difficult to bring to a successful conclusion. After consultation with the research team the study was left in the position that the owner manager would need to engage more fully with the project and provide the information needed. This has never been supplied so the study has not progressed beyond this point but remains open.

6.5. Analysis and Evaluation

Location of ICT services at end of study	Type of ICT support	Internet State post ICT PAR	New ICT Relationship Strategies at the end of the study
ASP, ISP and in house	No ongoing support – hardware and software purchased by owner managers	3 Transact	CRM newsletters, news updates on web site

Table 20 Case Study 4 ICT location and relationship strategies at the end of the studies

The Content Management System in this study was used as an information portal to promote the firm's services. This was part of the overall strategic development aims of the firm. The relationship strategies used by the owner manager have developed through the use of the Content Management System and were incorporated into his marketing activities. The newsletter system and the news updates on the site enhanced the firm's relationship strategies and have created a new on-line presence for the business.

The template design also promoted a professional appearance to customers (potential and actual) and to other rival companies. The adoption of these was understood and managed by the owner manager. He increased his armoury of communication methods through mass Customer Relationship Management via the web site. This impacted upon the strategic development of the firm. The firm's strategic development processes also now included e-business which gave rise to the ideas which formed phase 2 of the study.

Outside of mass email functions the data processing, gathering and collation within the firm have remained the same despite the advances of the e-business systems through the addition of the Virtual Learning Environment. The Virtual Learning Environment at Internet State 4 (integrate internally) was not effectively adopted by the firm. There would have been advantages for this firm to adopt the on-line submission of student's work, thus incorporating e-business applications into working practices and data processing. The firm's location was remote and may through the use of the Virtual Learning Environment have attracted more students outside of the area. The Virtual Learning Environment was also not adopted in any

meaningful way as a teaching instrument. This lack of adoption hindered the potential for the use of ICT processing within the firm.

In phase 2 we can also see that the failure to complete what was required to set up the hub meant that any new form of data processing (internally and externally) was also not developed. The researcher was willing to complete the project but the case study owner manager did not undertake what was required to move the project forward.

6.5.1. The nature, form and sources of enablers and constraints to e-business development within the study

Many of the problems this case study faced can be attributed to the owner manager's perception and understanding of e-business at different Internet States. In this study the firm moved initially from Internet State 1 to Internet State 2. It then attempted to migrate from Internet State 2 to Internet State 4 before finally moving to Internet State 3. The leapfrogging from Internet State 2 to 4 may have contributed to some of the hurdles to adoption, as this may have caused problems for the owner manager in understanding more complex e-business provision.

6.5.2. Internet State 2 Understanding and Development

In phase 1 the Content Management System was used as an information portal. The owner manager could see the value in this and it was within his understanding of e-business. The adoption of the Content Management System as a means of posting and sending information was a success and the e-business relationship strategies utilized by the owner manager evolved from Internet State 1 to 2.

He had absorbed and utilized the relationship strategies that the Content Management System as an information portal could achieve at Internet State 2 (publish). The adoption of the Content Management System as a communication tool influenced the strategic development processes of the firm. E-business tools are now part of the strategic development processes of the firm at Internet State 2 (publish).

6.5.3. Internet State 4 Understanding and Development

The Virtual Learning Environment represents a more advanced e-business application at Internet State 4 (integrate internally). The adoption of the Virtual Learning Environment at Internet State 4 (integrate internally) was not successful. It allows for the virtualisation of the teaching environment. This notion of the virtualisation of the teaching and classroom environment was alien to the owner manager.

His attempt to use the Virtual Learning Environment was also hindered by his lack of experience as a teacher. This was highlighted when no content was placed on the system. He simply may not have had any real content to put on the system, or he may have been embarrassed at the standard of teaching materials he had and did not want them displayed. His genuine request to ask students what they would like to see on the Virtual Learning Environment may have been valid if it had been placed within a framework of other learning materials.

In this study the inability of the owner manager to see beyond Internet State 2 (publish) could be a contributing factor to the Virtual Learning Environment's failure. He was not capable of seeing what was possible and thus could not include the development of the Virtual Learning Environment into his strategic planning and development processes. This lack of understanding may have led him to feel that the system was too impersonal and alien and could not reflect his relationship strategies.

His strategic development processes had not considered or foreseen the problems he would encounter using the Virtual Learning Environment. He could not reflect the relationships he has developed with his students, which is often one to one and personal using the Virtual Learning Environment. To do this he would need a deeper understanding of how the Virtual Learning Environment impacts on his current relationships as well as how it could be utilized as a teaching instrument. To fully understand this he would need to understand e-business systems at Internet State 4 (integrate internally).

In fact the owner manager felt adoption of the Virtual Learning Environment became a hindrance to the development of his relationship strategies. This was partly because he could be viewed by his students as possibly not understanding the system. The

owner manager needs to develop his e-business awareness from Internet State 2 (publish) to Internet State 4 (integrate internally). When this has been achieved either by learning and development dialogues with the researcher and/or through training on the Virtual Learning Environment, his e-business relationship strategies may be able to encompass what the Virtual Learning Environment can offer to enhance his teaching. This may result in the firm's strategic development processes incorporating e-business at Internet State 4 (integrate internally).

6.5.4. Internet State 3 Understanding and Development

The fact that the Virtual Learning Environment did not succeed was not viewed poorly by the owner manager. The adoption of e-business did impact upon the owner manager and the firm. An understanding of how e-business could be used by the owner manager enabled the development of a new business idea.

Through the proposed development of a hub several businesses were to work in collaboration. The owner manager via the real world relationships he has with other businesses attempted to utilize their services to increase revenue and open up new opportunities. This is evidence of e-business provision impacting on the strategic development path and processes of the owner manager.

To develop the hub he would need to understand e-business at Internet State 3 (transact). He would need to explain the hub to other participants at a level of complexity beyond his understanding. Thus his relationship strategies with other firms could not develop fully at Internet State 3 (transact). This may be due to the fact that as a sole trader he does not engage with others in his firm in learning and development dialogues except with the researcher when participating in this study. He is therefore inexperienced in dealing with others in this new development context.

This may have been a reason for the hub's failure. The owner manager also did not supply the required pricing and costing figures to place in the system. It was not possible to determine if the system was cost effective without knowing how much the walks cost. This may be due to the fact that the personal constructs of the owner manager had become "frozen" at this point in the hub's development. His lack of understanding of the system may have resulted in him not being capable of

proceeding and delivering the information. However it would seem logical that these costings would have been undertaken during the strategic assessment processes before the hub was proposed to others, including the researcher. This never occurred and highlights a weakness in his strategic development process.

6.5.5. Revealed insight into the Relationship Strategies with others in the study

When developing e-business the researcher was viewed as a trusted agent by the owner manager. The owner manager's reputation also needs to be of good standing with the other firms. This case study has highlighted the fact that the current and previous relationship history of the firm impacted on the potential of the firm to develop projects with others in e-business. The views of the participant firms in this study had a direct bearing on the success of the project.

When e-business reaches Internet State 3 (transact) outside agencies/firms and others may become involved. The activities they undertake can be collaborative or based in e-commerce. At this point the firm's relationship history and relationship strategies are important. If they are poor, collaborative e-business development will be difficult.

In phase 1 we see this problem through the lack of understanding of the relationship strategies needed by the owner manager when dealing with his students Internet State 4 (integrate internally). In phase 2 his real world relationships become a hindrance to e-business adoption at Internet State 3 (transact). This reinforces the view of the importance of relationships and relationship strategies in firms.

The strategies and development processes of the owner manager when using e-business was at Internet State 2 (publish). Little or no attention had been paid to the strategic development process of the hub at Internet State 3 and this contributed to its failure. The fact that the owner manager wanted to integrate the walking tours with the offer of accommodation in the local area demonstrated that he wanted to evolve the e-business relationship strategies he had into a wider arena with other participant firms. He had developed and evolved his potential for relationship strategies within his current understanding of e-business at Internet State 2 (publish) but his lack of

development and understanding meant that these could not fully develop when moving to Internet State 3 (transact).

Neither the Virtual Learning Environment nor the hub failed because of ICT. It was principally due to the relationship strategies and the strategic development processes of the owner manager.

Importantly, relationship strategies are of a differing level of complexity at Internet States 3 and 4 than at Internet State 2 (publish). This is because higher Internet States reach outside of the traditional boundaries of the firm.

It is also important that whilst Tse (2003) argues that constant rethinking of planning is important and this concurs with Wyer's (2003) notion of the cyclical nature of planning this is not to be confused with a lack of direction and not having clearly defined objectives and seeking results. E-business provision does allow for a great deal of flexibility in reaching goals and objectives but needs to be pursued with vigour by the firm in order to achieve success. It is evident that the lack of a strategic development process that includes an understanding of e-business above Internet State 2 contributed to the failure of higher Internet State e-business development.

6.6. Commonalties, Differences and Trends

In Case Study 3 the trusted agent status of the researcher was an important element in the successful development of e-business. In Case Study 4 the same trusted agent status was utilized and was successful. The researcher was viewed as a trusted agent by the owner manager and e-business development occurred.

In Case Study 4 it can be seen that the design of the systems had a major influence on the owner manager. He became involved in the work through contributing his views on how the system looked. This is based at Internet State 2 (publish). This gave him a sense of ownership which allowed him to be a part of the development process. This is common to all completed case studies. They felt that how the firm looked and thus was perceived is an important element in e-business. The sense of participation they experienced allowed them to become involved in a wider sense. By contributing to the design and seeing a rapid tangible outcome they were contributing to an element of the system they could understand. This gave them a platform that allowed

successful learning and development. This in turn had an impact upon their personal constructs making them more willing and able to absorb some of the more complex elements of e-business applications.

In this study an understanding of the location of services was not a hindrance to ICT adoption due to the previous basic web development experience of the owner manager. In Case Study 3 this was a hurdle to adoption in the early stages. In Case Study 4 the work moved forward quickly and allowed for the rapid development of e-business communication strategies. This involved publishing on the site and communication with clients is at Internet State 2 (publish). The understanding of e-business by the owner managers in the completed studies is principally at this level.

Both Case Study 2 and 3 were capable of adopting the Content Management System as new means of communicating with clients (actual and potential) and therefore adopted new relationship strategies utilising e-business at Internet State 2 (publish). They also felt the design of the systems impacted upon their relationship strategies. This applied equally to clients and other rival companies. Case Study 3 managed the e-commerce facilities at Internet State 3 (transact) when the researcher configured the system and completed the required work. This gave them a platform to move on to the ICT provision they finally adopted. This was at Internet State 4 (integrate internally).

Case Study 4 could not adopt the Virtual Learning Environment in any meaningful way. A Virtual Learning Environment is a complex e-business application and Case Study 4 does not have the resources or staffing levels of Case Study 3. The owner manager was reliant upon his own skills in a new business and was newly qualified. Case Study 3 has been in the optical industry for over 50 years and the senior management therefore had a clear understanding of the company's industry. This cannot be said of Case Study 4 who was new to education. Case Study 3 went on to adopt a more complex e-business provision which Case Study 4 did not. This may be due to the larger resource base Case Study 3 could call upon. It may also be due to the fact that they have multiple locations with large amounts of data to process and thus they have a greater need.

Case Study 3 and 4 have a clear idea of the relationship strategies required at Internet State 2 (publish). Newsletters and posting of information are examples of Internet State 2 (publish) relationship strategies. This was incorporated into their strategic development processes. At Internet State 2 they have an influence outside of the firm but may not involve any collaboration with others. When moving into more complex e-business provision at Internet State 3 (transact) both studies found relationship strategies challenging.

Case Study 3 found that the ICT implementation impacted across the firm in ways they did not predict. Case Study 4 also did not perceive how his previous relationships would have an impact upon his e-business development. There is a clear trend that the development and understanding of e-business within the firms studied is best understood at Internet State 2 (publish). Development of e-business at Internet State 3 (transact) and beyond can have an impact upon the firm in ways they did not foresee and this can cause problems in e-business development. Case Study 3 only achieved the more advanced Internet States after some difficulty.

This may be due to the fact that e-business development beyond Internet State 2 (publish) has the potential to break down the traditional boundaries of a firm. This can be by new data processing or communication methods. These need to be better understood by the small firm prior to e-business development. At this point the role of the e-business enabler as a trusted agent could have new value. The established relationship of trust can now be used to encourage the owner managers of small firms to look beyond the role of e-business as simply more advanced data processing. It now encompasses the development of relationships at new Internet States. A more holistic approach by the e-business provider can assist with this.

7. Case Study Five

7.1. Introduction

In phase 1 of this case study many of the developments of e-business occurred during the research process. The researcher fully engaged with the methodology and used PAR to facilitate e-business as it evolved via the owner manager's changing perception and use of ICT. As his personal constructs changed and developed, e-business deployment within the study evolved with these developments. This fluid approach allowed the owner manager to use e-business as a tool in developing new relationship strategies that evolved during the work. These had an influence on the strategic development process of the firm. Phase 2 of this work demonstrates new insight into the development of e-business and the use of personal contact networks.

7.1.1. Case Overview

This study began with a small firm based in the construction industry. The business is a partnership of architects, builders and property developers located in Berkshire. As the study evolved the focus of the business and thus of the case study oriented into a different industry sector, motor sport and finally in phase 2 back into the construction industry.

The owner manager is a successful entrepreneur with over 30 years experience in the construction industry. He is a director of several vibrant companies that are involved in architectural services, property development, surveying and property management. The researcher initially made contact with the owner manager to study e-business within his architect's practice. At the first meeting the owner manager informed the researcher that he was involved in motor sport and he managed a racing team. The team had a web site and the ICT provider who hosted the site had ceased trading. The owner manager asked if the researcher would be interested in taking over the web site and in return the motor sport team would agree to participate in the study. Following a meeting with the research team this was agreed.

7.1.2. Background and Development of the Study

The researcher conducted face to face interviews with the owner manager. Key informant inputs were derived from the racing driver, sponsors of the team and other racing team managers. In an interview a race team manager from a competing team informed the researcher that motor racing is a highly competitive sport and is extremely expensive. At the time of the interview the participant race team was competing in the British GT series and this was costing around £240,000 per year for 10 -12 races. The cars in this series have two drivers each paying £10-12,000 per race for a 30 minute drive, exchanging drivers at the half way stage. The competition amongst the race teams to get the best drivers is fierce. Despite the cost of driving in a race there were more drivers available than races held. Drivers often changed teams during a racing season, either to race in a more powerful car managed by another team or the race team would find a faster driver. Race teams were judged solely upon results and winning races was viewed as the prime objective at all times. Any loyalty to a driver was considered to be secondary.

The race team had several sponsors and one of these was interviewed by the researcher to build understanding of why a sponsor would invest in motor racing. This sponsor invested over £50,000 each season in the race team. The sponsor was involved in the construction industry and was a senior manager in a very large firm that had a multi million pound turnover. The sponsor had met the owner manager during their working lives and had found they both had an interest in motor racing. The firm he worked for sponsored various sporting activities. In return for financial sponsorship the firm had its corporate branding featured on the car and the race team hosted a series of corporate events at the race track for the firm's clients. The race driver would also be called to appear at other corporate events held by the firm.

The researcher also interviewed the racing driver. To become a racing driver requires a racing licence. This entails undergoing rigorous medical testing and assessment of driving performance. Licences are issued in differing classes of racing and to stay in a class a driver must race each season in that class or lose his licence. He is very physically fit and his work when not involved in racing was as a mechanic servicing and repairing high performance sports cars. The race team owner manager was the father of the racing driver. They both shared a passion for motor sport. The teams

and the driver's progression have been rapid and successful and by the end of 2006 the driver was racing in the British GT series at home and abroad. In 2006 the racing driver won the BRDC (British Racing Drivers Club) Driver of the Year award.

The race team manager and the driver both had the strategic development aim that the racing driver would be offered a professional drive and reach professional driver status. This would mean that a major race team would pay the driver for racing a car as opposed to the driver paying to race. This only happens on very rare occasions and to only the most talented drivers. In order to achieve their development aims the race manager knew that the major race teams would need to see any potential driver race. This needed to be in a competitive race class such as the British GT series in which the cars are only slightly below the standard of the LMP1 class (the highest rated cars used in the 24 hour Le Mans race). This is extremely expensive and the race team manager relied heavily on sponsorship to fund these race activities and facilitate fulfilling his strategic aims. He also funded many of the races out of the profits of his architect's practice. He was always seeking new sponsors to ease his financial burden. The driver's progression through the ranks meant increasing expenditure which the race team manager was finding increasingly difficult to meet. The closer the team got to reaching their strategic development aims the harder it became to manage the financial elements of a competitive race team.

The race team manager also dealt with the day to day administration of the business. He had no marketing skills and had engaged in no marketing activity. The sponsors he had gained were from the relationships he had developed within his architect's practice. He was interested in developing activities with the researcher that may enable new sponsorship to be attracted to the team. This could assist him in fulfilling his strategic development objective of increased funding which would allow for a wider exposure of the racing driver's talents in major events.

7.1.3. Case Study ICT Structure

The race team manager used ICT for keeping the financial accounts of the team. This was done on a workstation in his home office. Invoices were sent via email and traditional post. Management of the bank accounts was done on-line, but payments

were made by cheque. The race team manager explained he used ICT “when he had to” for management of the team. The race driver did not involve himself with any of the day to day running of the race team and concentrated solely on developing his racing skills.

Location of ICT services at outset of study	Type of ICT support	ICT Relationship Strategies at the outset of the study
ISP and in house	No ongoing support – hardware and software purchased by owner managers	Telephone; facsimile; mobile telephone; PC; Internet; electronic mail;

Table 21 Case Study 5 ICT location and relationship strategies at the outset of the studies

The race team manager used email in his daily business and found it a very useful tool in communication. He did express concern that email messages can sometimes be misinterpreted and he relied on the telephone as a richer and deeper source of communication. He liked the “personal touch” in his dealings with people and he found that the telephone was a good means of achieving this as he could not always attend meetings in person. He viewed the relationships he had formed during the team’s racing career as very important. At race meetings he would often spend hours meeting other race team managers, sponsors of the team and other drivers. He would do this to cement the relationships he had and to engender new ones.

7.2. Phase 1 Case Study Facilitating Instrument: ICT web based application(s) utilized for Participatory Action Research

Internet State prior to ICT PAR	Tapscott theme	ICT used for study
2 Publish	Virtualisation	CMS

Table 22 Case Study 5 ICT web based application(s) utilized for Participatory Action Research Phase 1

The race team had a static web site at the outset of the study. This was updated infrequently and the ICT did not allow this to be done without specialist knowledge of computer coding which was beyond the skill set of the race team. In the initial interviews with the race team manager it became clear to the researcher that the race

team manager was interested in the development of a new web site but he had reservations about how he could assist. He stated that he had very little experience or skill in ICT and that to expect him to be actively involved in the management of any new e-business application was unrealistic. He expressed concern that he would not be able to manage any new systems and this could be a hurdle to the development of e-business. He was happy to provide content in the form of images and reports on future race meetings and he had a library of the team's historical development which he would make available. He was very busy with his architect's practice and what limited time he had would be devoted to the development of other race team activities.

These issues were discussed with the research team and it was agreed that this case study's primary focus would be on utilising e-business to assist with securing the team's overall strategic development aim of achieving professional driver status and increasing the team's funding to help facilitate this. To achieve this aim the systems would focus on the team's relationships. These could be with sponsors, press and media, other race teams, car manufacturers, fans and the general public. Increased exposure may lead to more sponsorship through a higher profile the team could generate. The research team felt that a Content Management System was the most appropriate e-business vehicle.

Earlier case studies had shown that the design of the site was a key element in the case studies perception of change and development of e-business applications. If the design of the system was discussed before anything else the morale of the project was raised. The race team had a team logo and team colours that they used in race wear. The team of graphic designers used in the earlier case studies were also used in this study. They visited the team manager and presented a range of updated logos and team colours. These were very well received by the team manager and a new design was chosen and was incorporated in the Content Management System. The new logos were also placed on the team's shirts, hats and team literature. The researcher undertook the ICT work to build the system and complete the import of old content from the old site. The race team manager and the racing driver provided content from the team's historical library and fresh content for the new site.

The researcher and the team manager then examined how the strategic development aims of the team could be facilitated using e-business tools. Motor sport relies heavily on sponsorship and therefore the relationships between the team and the sponsors, fans and spectators are very important. The researcher and the team manager considered these relationships to be one of the critical aspects in running the team and therefore any Customer Relationship Management systems should reflect this. Particular attention was paid to the way these could be enhanced via e-business provision. The researcher added the following items to the Content Management System:

- Banner advertising with links to sponsors web sites
- On-line videos of previous races

The old site had images of the sponsors' logos but these did not link to the sponsors' web sites. These links were created in the new site within a frame of the race team's web site. The new Content Management System could record the amount of times the links were clicked through by users and reports were made and given to the race team manager. He now had evidence that the e-business application added to the value of the sponsorship package. He was pleased by this development and informed the sponsors of the reporting capabilities. This is an example of e-business influencing the relationship between the sponsors and the team and how the personal constructs of the team manager had taken on board the development of the Content Management System.

The on-line videos of previous race wins by the team proved to be extremely popular. Fans, sponsors, race team competitors and the general public could now view the past successes of the team, through the additional capabilities of the e-business application. It provided a development context communicating the race team's history. Some of the on-line videos were available without registration on the Content Management System others required users to register. This was done to build up a user base within the Content Management System for future relationship developments.

Importantly potential sponsors could now see in far greater detail what they may become involved with. The team manager used the on-line videos in his negotiations with potential sponsors by directing them to the web site. This is another example of the team manager's relationship strategies being influenced by the development of e-business.

The next development stage occurred with the creation of:

- Branded newsletters with sponsors' logos.

The researcher and the team manager met frequently to discuss the development of the Content Management System and general developments within the team. During one meeting after the first race of the season the team manager said he would be sending an email to sponsors detailing the race. He had just given the researcher the race report which was to be uploaded on the Content Management System. The researcher asked how the emails were to be sent. The team manager said he used his local workstation at his office and he sent a "group email". The researcher explained that the site was capable of sending out emails and these could be configured with the team's logos and colours. Sponsors logos could also be included in the email with links to their sites. This would add to the electronic links the team had with sponsors and thus enhance the relationship.

The researcher also explained that the site also gathered information about registered users. These new users of the site could be emailed along with sponsors via the Content Management System allowing the team a far wider reach in the dissemination of information and news about the team. The team manager saw the value in this and together they designed the newsletter and it was decided to send this out after every race meeting. This added to the richness of the communication with all parties and was encompassed in the relationship strategies of the team manager.

- DVD productions incorporating the sponsors' logos and links

The team manager and the researcher met again a few months later. The team manager wanted to send gifts to sponsors (potential and actual). The researcher and

the team manager discussed the options. The team manager wanted to send a gift that raised the profile of the team. At the race track during a meeting with another team the race manager had seen a DVD of the other team's previous season highlights and asked the researcher if this was possible to do this for the team. He felt a DVD was a good medium as people did not need a computer to view it. It could be viewed on a DVD player in the home environment. He felt this was of value. Further discussions by the team manager and the researcher enabled the on-line archive of team races to be placed on DVD. These were further enhanced by an introduction section featuring the logos of sponsors. The DVD packaging also contained the logos of sponsors. The team manager utilized these DVDs by sending them to current and potential sponsors. The DVD also became useful as part of the "media pack" that was given to the press about the team.

This is another example of e-business influencing the development processes of the team manager. In this case this was due to the team manager seeing that other race teams produced DVDs. They wanted to be seen as a professional team and this development of e-business was used to keep in step with the development of teams around him. He then, through incorporating the sponsors' logos on the DVD, enhanced the sponsors' relationship to the team by presenting this personalised gift.

The personalised gifts were very well received by the sponsors and the team manager now felt he had richer material to offer the current and potential sponsors. He also gave sponsors branded team wear. These were in the form of t-shirts and fleece jackets. This led to the next development stage:

- E-commerce facilities to purchase team merchandise

The team manager and the researcher felt that to appear more professional as a team it would look very good to sell the team's merchandise. Larger race teams undertake this to great effect. The team manager thought that, by selling team clothing on line, sponsors would also see the value of the merchandise and feel that they were getting added value as the clothing to them was free of charge.

E-commerce facilities were installed on the site and merchandise was offered for sale. This proved unsuccessful and no sale was ever made on the site. However, this

step into e-commerce was not considered to be a failure by the team manager; he used e-commerce as a means of raising the profile of the team. E-commerce in this case study was used in a relationship strategy context and not for the “sale of goods”.

The final development stage of the Content Management System occurred at a race meeting:

- An SMS text messaging system

The race driver had done very well in the qualification stages of a race and was in pole position for the race the following day. The race team manager was very excited about this. Not all of the sponsors were at the race track and he was telephoning them in turn and informing them of the team’s progress.

This was taking some time and the team needed to prepare for the race the following day. The researcher suggested to the team manager that a solution to this was the team could send an SMS message that was configured so that it appeared with the name of the race team as the telephone number on the recipient’s phone. The team manager liked this idea and an SMS system was installed on the Content Management System. An SMS message was sent to all registered users of the site after all future races. This enabled real time track updates of race progress to be sent to those who were not at the track side. This proved to be extremely popular and the team manager knew of no other race team that did this. He was very pleased to be seen as a leader in this form of communication. The telephone calls he received from sponsors after the messages were sent rose considerably. This new form of e-business was easily adopted by the team manager and increased the relationship strategies he used with all parties involved.

In January 2008 the site had had over 927,000 hits making it a huge success. The new systems have raised the profiles of the team and importantly the sponsors. Linking the team’s site to the sponsors’ sites had also increased the hits of the sponsors’ web sites, giving new added value to the sponsorship package. The team owner said

We would not have been as far down the road today was it not for you

(providing e-business systems)

The Content Management System and the new related e-business relationship strategies were very well received by sponsors who also saw the new look and ICT development as a development of the team. E-business had given the team a more professional appearance. This could assist them retaining and obtaining future financial sponsorship. All participants still viewed the results on the race track as the primary aim of the team and e-business was useful but only in secondary activities.

On one visit to a racetrack the researcher spent some time with the owner of the race team. They were watching the race car being tested a few days before a race. They were chatting in a relaxed and friendly way. During this conversation the team manager said that he enjoyed using a major auction site and often bought goods on it. He then went on to say that the automotive industry has a major site for the purchase and sale of new and used vehicles and there was not such a site for the construction industry. He then proposed that we (the researcher and the team manager) begin one. The results of that work form phase 2 of the study.

7.3. Phase 2 Development of the Case Study

7.4. General Details

The owner manager of the motor sport team saw the potential to integrate e-business provision within his main business, his architect business. In phase 1 the personal constructs of the owner manager had developed to embrace e-business within his strategic development planning and processes, thus leading to this idea and this phase of the study.

The construction industry is a high volume and high turnover sector in most economies, contributing significant amounts to GDP. The industry has many branches that are interdependent of each another. The owner manager's idea relates to the use of e-business to facilitate and develop economic and networking opportunities. It explores the use of B2B (business to business) exchanges, directory listings, e-commerce and auction systems to create revenue for the providers and hosters of the system as well as networking opportunities.

The site is to be developed with the intention of enhancing the owner manager's current relationships and developing new relationships. The owner manager would approach others in the industry he knew and ask them to join the site to kick start the project.

Several people were actively involved in the planning and development of the system. They range from academics specialising in strategic development and planning to accounts staff who were involved to develop the administration of revenue collection via the web interface. Key informants were derived from interviews with people involved in the construction industry and specialist magazines and the literature.

7.5. Phase 2: Case Study Facilitating Instrument: ICT web based application(s) utilized for Participatory Action Research

Internet State prior to ICT PAR	Tapscott theme	ICT used for study
2 Publish	Virtualisation	CMS

Table 23 Case Study 5 ICT web based application(s) utilized for Participatory Action Research Phase 2

The case study instrument utilized in this study is a web based portal for the construction industry. The services on offer are targeted at a range of users from end users (DIY enthusiasts) to large businesses creating a one stop solution for the construction industry. The functionality of the site was decided after several meetings over a six month period. The concept was developed from the idea by the owner manager that the construction industry is known to create wastage in its building projects. Often these excess materials and goods are discarded or stockpiled tying up capital or wasting resources. An auction site could be a vehicle for building companies and DIY enthusiasts to either sell or obtain materials that otherwise would be wasted.

From this premise the owner manager developed other related ideas. The system could be a portal or "one stop shop" for all building related needs. There could be a directory listing of building companies with customer reviews, and e-commerce shops. Forums would provide advice to consumers on building projects. It would also be possible to develop networking opportunities for companies to grow through

access to financial aid, land purchases or expertise. Each of these areas has potential for revenue generation for the providers of the system, in this case the owner manager. The site would be large and complex offering a range of solutions and services across the industry sector. This site cuts across industry sectors and has an appeal to all levels of users from the home enthusiasts to the large developer.

The system was developed to a “shell stage”. All of the functionality requested was put in place by the researcher. The researcher then requested that the owner manager contact his business network and ask them to become involved. Although he agreed to do this, he never actually did so. Further examination by the researcher about this determined that he was reluctant to place his business network onto the system.

He placed great value on his network and it was something he had nurtured over many years. He expressed reservations about how the e-business application would impact upon his network. He had no concrete issues but just felt unsure if he wanted to do this. Several times after this the owner manager cancelled or postponed meetings. He said this was due to the fact that his time is in constant demand. He said to the researcher on more that one occasion that if he lost all his business he would happily take this on board but he simply does not have time to develop this idea fully. This project is still open and awaits development.

7.6. Analysis and Evaluation

The ICT systems in phase 1 of the study moved from Internet State 2 (publish) to Internet State 3 (transact). The site is viewed as successful by the team, sponsors and fans. There has been a significant development of the firm’s relationship strategies.

Location of ICT services at end of the study	Type of ICT support	Internet State post ICT PAR	New ICT Relationship Strategies at the end of the study
ASP, ISP and in house	Researcher acting as a trusted agent and training others in the firm.	3 Transact	CRM newsletters, news updates on web site, DVD production, banner advertising, SMS

Table 24 Case Study 5 ICT location and relationship strategies at the end of phase 1

The Content Management System collected data about users and this could be used to send targeted information. This fitted with the strategic development plans of the team manager. They wanted to create and build an on line presence to attract user's who may become sponsors. These new additions have added to the e-business relationship strategies of the firm. The Content Management System also enabled the new banner links and these were further developed through the use of the rich mediums (on line video).

The race team also utilize e-business outside of the Content Management System and the Internet through the use of DVD and SMS systems. This wider reach of e-business applications was welcomed by the firm and those who received it. DVD and SMS remove the need to sit at a workstation and have encompassed new forms of media communication, mobile telephone and DVD players. By doing this the firm have diversified their current, and evolved new, relationship strategies.

In Figure 14 we see the relationships that existed prior to the systems being in place and how they have changed, or how new relationships have formed since implementation of the e-business applications. This Figure focuses on the relationships of the motor sport team.

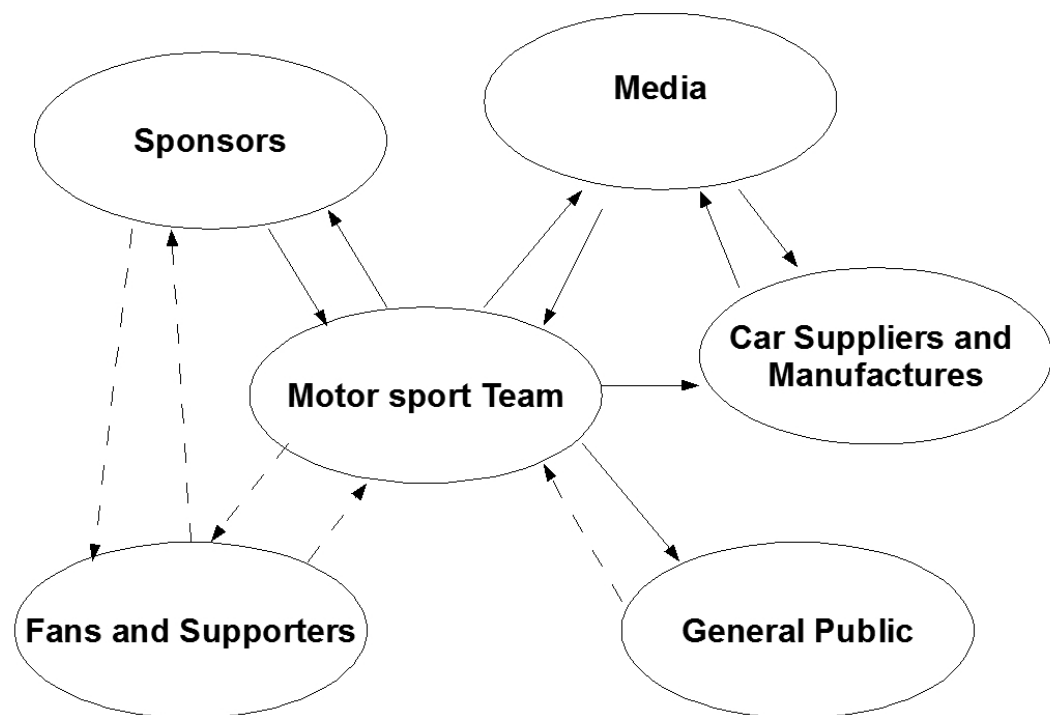


Figure 14 Case Study 5 New E-business relationship strategies

The solid lines represent the relationships that existed prior to the e-business implementation the dashed lines indicate new relationships. The dashed lines demonstrate the new reach of the e-business applications in developing on-line relationships. These new relationships fall mainly in the area of the fans, supporters and the general public with the sponsors of the team.

The new reach of the e-business applications allow for sponsors to strengthen and develop links with fans. This allows sponsors the ability to promote their services to fans if they wish. Fans and supporters register on the site as opposed to the general public who simply view information on the site. The registration process which allows free downloads and extra content to be seen creates a new relationship between the fans and the team which the team can then use to promote the sponsors. Links with the media have been enhanced with a press area on the site making the access of information easier to obtain.

ICT used for data gathering, collation and processing (internally)	New ICT used for data gathering, collation and processing (externally)
Fax, email, spreadsheet, accounting software, telephone.	CRM e-commerce

Table 25 Case Study 5 ICT used for data gathering, collation and processing at the end of Phase 1

The data gathering and processing in this firm did not evolve except for the use of the addition of users on the Content Management System. The Customer Relationship Management via the registration facilities on the Content Management System gathered information that was used in a relationship management context when sending out newsletters, SMS and DVDs.

The sale of goods via e-commerce would have had an impact on the data processing procedures within the firm. The management of the stock was not treated as a possible revenue stream for the team and the cost of the goods was written off as promotional items. Nobody in the team viewed the sale of goods (e-commerce) as important to the business. It was thought by the team that the sale of team goods on the site was a good way to increase the professional look of the team but they had no expectations that they would sell goods. Any data processing was undertaken within the spreadsheets and accounting software the team used.

In phase 2 the work was not fully completed. Although potentially a large and complex web site this system does not go beyond Stone's Internet State 3 (transact). Through a web interface large and small companies can engage thus generating potential new trade links that may not have been previously possible. This represents Tapscott's (1996) notion of disintermediation, the break up of the traditional value chain. End users (consumers) also have access to trade materials that may have been wasted previously. Experts from the construction industry can offer advice to end users and work with small building companies through the web site. Gray (2006) classifies this system as a cluster of firms. He defines a cluster as:

Clusters are less formal relationships, agglomerations of people offering complimentary professional services or products. They often exist owing to distribution advantages and, typically, although they co-operate, they also compete.

We can see that this web site sits within this classification with the owner manager of the system being the key firm. It provides the hosting, and importantly the fostering and the development of the real world relationships into the on-line portal. The system was not completed. An analysis of why this did not happen is detailed in the next section.

7.6.1. The nature, form and sources of enablers and constraints to e-business development within the study

An important consideration in this case study is the fact that the team manager at the outset made it clear that he had very little ICT experience. Therefore he would not manage or engage in any meaningful way with the e-business applications. This could be due to several factors. He may not have had the time as he stated. This being the case he would welcome somebody else taking on some of the burdens of marketing of the team.

He may have a fear of engagement with the e-business applications as he had no understanding of them or had suffered a poor experience when learning about ICT in the past. Also, due to the busy nature of his life and the pressure he was under he may not have the time to allow for his learning and development in this area. He did though, via the trusted agent's relationship that the researcher provider created, allow for the development of the systems in an area that was very important to him.

The linear and phased development of the e-business assisted the team manager in absorbing each new stage within his personal constructs. The developmental staged growth of e-business influenced his personal constructs supported by learning and development dialogues with the researcher. He saw the value of e-business in assisting with his goal of achieving professional driver status and developing new sponsorship to help this process. This led him to adopt new relationship strategies via ICT. His personal constructs in the development and the management of relationships adjusted and allowed for the inclusion of e-business, as facilitated by the researcher acting as a trusted agent.

He then built upon these via his real world relationships with sponsors and others. His knowledge that he was developing the team into an area where he was needed to be seen as professional was important. When he sought sponsorship he relied heavily upon the skill of the racing driver to win races. This was also his strongest tool in his negotiations with other teams for new drives. In these negotiations he now mentioned that the team had very sophisticated ICT that would be useful to all parties. This demonstrates that he had incorporated e-business into his negotiating strategies as well as acknowledging the sophistication of the ICT used.

There is a danger in this study that the trusted agent relationship that had developed between the researcher and the team manager is too dependant upon the researcher providing the e-business applications. The team manager is not fully engaging with the management of e-business. If the researcher were to leave the team (the race team manager now views the researcher as part of the team) then the knowledge of the management e-business could leave with the researcher.

Any future ICT provider would find it difficult to engage with the team manager to the same level of depth as the researcher has. Thus the Participatory Action Research elements of the research need to be managed carefully. The researcher should not be a crucial element in the final development outcome but a facilitator of change and development within the firm. The research team felt the best solution to address this issue is for the researcher to impart his knowledge to another. The racing driver's brother has an interest in ICT and the researcher spent time with him to develop his skills and knowledge so the researcher could leave the team without an impacting upon the e-business provision.

E-business development did have an impact upon the strategic development processes of the team manager and in particular his relationship strategies. Relationships are important for all firms and this is particularly true when sponsorship is needed. The world of motor sport has a different environment to the traditional world of business. Money is provided by the sponsors and no direct return is given in terms of goods or services. The services given are ethereal and difficult to measure. This makes the relationships that exist between the team and the sponsor very important. This relationship relies heavily on association with each party each benefiting from each other. The team get the funds needed to race (£12,000 per race) the sponsors are associated with a race team and have their logos on the car. They can also bring clients to the racetrack that can create an impressive image for the sponsor. They can bathe in the reflected glory of a (hopefully winning) race team. This type of association is unusual in the small firm environment. The joint promotion of the team and the sponsors sets out to achieve the same goals, raising the profile of all involved in a positive light.

This study has shown that E-business can be very helpful in achieving this. The promotional material generated (DVD, SMS) can be used by all parties. Importantly it can be used outside of the racing environment in wider promotional contexts. The owner manager (team manager) saw the value of e-business in a wider context than just use of the Content Management System. The use of these tools broadened the e-business relationship strategies used. The creation of an “off line” and “on line” link through more traditional communication medium was innovative within the race environment and was the first case study to adopt these methods. This moves e-business facilitation into new areas of reach and market penetration.

One use of e-business for this team is to enable it to appear professional in relation to its competitors. The team has grown very rapidly and is now competing with racing teams that have a much larger budget and staff. Sponsorship may be given to other teams and the team manager needs to find innovative ways of attracting and keeping sponsorship.

E-business has been adopted and embraced by the team. This was primarily achieved by the owner manager’s development of his personal constructs. This was done by engaging in learning and development dialogues with the researcher. Each stage of

the development process was a learning and development point for the team manager. His personal constructs were flexible in being able to adopt the e-business processes that were useful to the team. Importantly he also saw the value of the e-business process that may have been considered a failure. The e-commerce elements of the Content Management System did not sell any goods but the team manager adjusted his relationship strategies to include the e-commerce elements of the system as a way of promoting the image of the team. His strategic development processes also adjusted to the e-commerce failure and the “goods for sale” site was used to bolster the team’s relationship strategies.

As the study progressed in phase 1 the team manager had absorbed and learned a considerable amount about the use of e-business with the racing environment. This knowledge had impacted upon his personal constructs. Evidence of this change in his personal constructs can be found in his examining the strategies and development context of his architect’s practice. He now seeks to use the knowledge he has gained about e-business as a means to expand into a new business area within his own construction industry sector. The new proposed construction site has its foundation in e-business ideas proposed by the team manager.

In phase 2 we see the owner manager attempting an ambitious project. The system is large and complicated and this may have been a hindrance to development. The researcher also felt that the owner manager is far more comfortable dealing with his core competencies (which are based not in e-business) and this system, whilst involved in his industry sector, is something he does not fully understand. This shift away from his core competencies into e-business may be a contributing factor to the slow development of the system.

The owner manager feels very comfortable within his knowledge base and skills. E-business to some extent moved the owner manager away from a central control point as he could not directly manage the system; this was to be done by the researcher. The owner manager runs a small firm. He enjoys having hands on control of his businesses and interviews with him on more than one occasion demonstrated that he does not wish to expand beyond a stage where he does not have full control of his business. He defines control as having a hands on approach and knowledge of all events and activities within his business. This may be a key reason why he is

reluctant to develop this system as it involves him not being fully in control or understanding entirely how it all works. It may be 'one step too far' with regard to his personal constructs of ICT and its potential, with this project taking him out of his 'comfort zone'.

Whilst the researcher has a very good relationship with the owner manager as a trusted agent, it is still a major step to bring in aspects of his very successful business to a web based system that the owner manager does not fully understand or control.

To make the system viable the owner manager would need to map his real world business relationships to the e-business system. The relationships the owner manager has developed have been nurtured over many years and he guards them very carefully. He views them as one of the most important elements of his business. He may well feel that to place them in a position where he does not have full control could place them at unnecessary risk.

E-business using the EBDP removes a degree of control from the owner manager and this may have contributed to the slow development of the system. He keeps his own business small and compact, thus enabling an e-business could change that through expansion and growth. This may appear to be obvious after the event, but the owner manager did not have the knowledge of how this system would impact upon his working practices until he had started the process. He had no frames of reference from his past experiences in developing e-business except those in phase 1.

In phase 1 the e-business was managed by the researcher and the benefits were based on enhanced relationships and did not impact upon his daily working practices. In phase 2 we see that there is a much greater degree of integration with his current working practices but this may not have been evident to the owner manager until the systems were in place. His personal constructs did not foresee or allow for this eventuality until evidence of it became apparent through implementation.

Phase 1 saw the enhancement of relationships. In phase 2 we see a much closer integration of real world and on line relationships. The on-line relationships managed by the researcher are not in the owner manager's direct control and this may have been a key reason for the project stalling. This system may well develop but it will take much longer than was first anticipated. Enabling a large and complex system

such as this one may well be better facilitated in stages, allowing for all parties to develop their ideas and understanding in conjunction with the growth of the system. The personal constructs of the owner manager may need time to adapt to the system and this may help in development. The systems development may be best suited to a path that matches the personal constructs and learning of the owner manager. As his understanding grows so the system could evolve. This was effective in phase 1 of this study. In phase 2 the owner manager had not understood all the processes in the same gradual manner. This may have caused the work to stall.

Importantly this work has shown that developing hubs and networks impacts upon this owner manager's perception of control. Fillis and Wagner (2006) suggest that inclusion of PCNs (personal contact networks) in ICT implementation aid in the success of entrepreneurial activities. However this has been difficult to achieve in this phase of this case study due to the reluctance of the owner manager to do so, even though the e-business provider is viewed as a trusted agent. It is the very ownership of the owner manager's PCN that is one of the hurdles to adoption because of the impact this may have on the owner manager's real world relationships and working practices. The owner manager may utilize his PCN via ICT on his local workstation but was reluctant to do this via the EBDP. This may happen in time as the relationship between the researcher and the owner manager evolves.

The owner manager can and does evolve and develop working practices within his firm. During the time that this work was undertaken the government opened up the national planning portal. This enables architects and others to submit planning applications on-line without the need for paper based planning applications. This change impacted upon the working practices of the owner manager.

He examined the working practices within his architect's office and purchased equipment that enabled his workforce to scan in incoming documents and store them on his local server within his office. Remote access to his office was enabled and this meant his paperless office was accessible via the Internet.

This change in working practices was initiated by events outside of his control. The planning portal meant he could submit plans to any local authority in the country as opposed to just his local authority. The owner manager saw the possibility of

developing his business and with his awareness of what e-business could do by saving printing costs and enabling remote working. He adapted his business to be in line with current developments. This concurs with Fullers (2000) and other author's notion of co- evolution. Small firms on the whole develop together. Neither of these events impacted upon his relationship strategies. Importantly the owner manager kept control over the technological changes occurring in his environment. When developing the new web site in phase 2 he did not feel he had the same level of control.

7.7. Commonalties Differences and Trends

In phase 1 of this study it can be seen that design of the systems once again plays a crucial role in involving the owner manager. Although the race team had team logos and designs, incorporating these into the web site assisted with the cohesion of the web site with off line relationship building activities.

The design consultation process helped cement the relationship between the researcher and the owner manager via a trusted agent's relationship. This allowed for learning and development dialogues to occur. The design of the site also helped improve the professional image of the team, thus raising its profile with sponsors, fans, media and other competing teams.

In this case study the owner manager did not involve himself with the actual updating of the site. This was handed over to another member of the team once the initial developments had occurred. Importantly the systems were enhanced and developed slowly involving the owner manager at each stage of the development process. At each stage the owner manager could incorporate the developments into the relationship strategies he used when dealing with sponsors, fans and clients. These strategies widened the development of e-business application. We can see that the use of DVD and SMS systems were innovative and extended the reach of the Content Management System.

This is the first case study to adopt this wider e-business approach and it was developed by the owner manager and the researcher planning and developing together. The systems were managed by the researcher and thus these possibilities

were achievable. In Case Study 3 the more advanced systems used in phase 2 were put in place by another ICT provider and thus could not be developed so easily. There was less flexibility in the adoption of e-business as they used a commercial e-business application.

Although this study adopted a wider approach to e-business in phase 1, it is at Internet State 2 (publish). The systems were capable of Internet State 3 (transact) but this was never used except to raise the profile of the team. The owner managers' perception of e-business in phase 1 is at Internet State 2 (publish).

In phase 2 of this study it can be seen that there is a lack of understanding of e-business systems by the owner manager. This lack of understanding was a stumbling block to the adoption of e-business even within the boundaries of an ICT provider acting within a trusted agent's relationship. The inclusion of his PCN (personal contact network) via the EBDP was also a hurdle to adoption. The owner manager felt that despite inputs from expert sources he was still unsure of how to proceed. His personal constructs were not ready to deal with the development of e-business in this way by including his PCN in a more advanced e-business application.

Time and an ongoing relationship may well prove to be the key to realising this project. As in Case Study 4 this project in phase 2 did not fully develop. In the previous study this was due to the poor reputation of the owner manager. In this study time, lack of understanding, control of the systems and the value of PCN (personal contact networks) all contributed to slow development.

In phase 2 of both studies e-business did impact upon the development strategies of the owner managers. It can be seen that awareness of e-business changed the owner manager's perception of what could be achieved within their businesses.

The reasons for the non adoption were different. Both studies show that e-business had a profound impact on the personal constructs of the owner managers. The owner manager of Case Study 5 bases his reputation upon results. The owner manager has engendered this reputation over many years. The construction industry relies heavily upon reputations and this forms a critical part of this business. The owner manager of Case Study 4 did not have this luxury.

The owner manager of Case Study 5 has little understanding of any ICT and this may well be a contributing factor to the slow development of the system and thus the integration of his PCN. E-business is not part of the core competencies of most small firms. This lack of understanding and the potential to disrupt the relationships fostered may mean that owner managers may be slow to adopt processes they do not control.

At Internet State 2 (publish) we see that using the Internet as an information portal does not impact on these relationships. Moving to Internet State 3 (transact) does little to change this, as e-commerce is something that owner managers feel they can control. Hubs, networks and groupware applications do impact upon working practices and therefore may need a different relationship strategy by the ICT provider to enable the owner managers to understand what may occur. Case Study 3 experienced problems when developing e-business beyond Internet State 3 (transact) and Case Studies 4 and 5 experienced problems when developing hubs and networks. The development of more advanced e-business applications needs to consider wider elements than just ICT implementation. Advanced e-business can impact across the firm its working practices and relationship strategies. If these are not managed effectively the development may stall or not occur. The raising of awareness of these issues by the e-business provider and the adoption of strategies to overcome these hurdles is where an e-business provider may be able to assist. This will be aided considerably by a long term trusted agent's relationship.

8. Discussion of Findings

8.1. Introduction

This chapter considers the key findings of the case study investigation within the context of the specific dimensions and issues embedded within the objectives of this research study in its totality. Firstly, specific issues and learning points within and across each case study are teased out and discussed. This is done by utilising discursive frames of reference in the form of key potential small business development actions and activities. These discursive frames of reference are dimensions implicitly embedded within each of the research objectives and which in the practice of completing the case study investigation have been found to have specific relevance within each case. This is in terms of the positive ways particular case firms have undertaken such actions through effectively anchoring in ICT and with regard to a negative connotation where a case firm may not be adopting such development actions. Thus, in research objective one, for example, the study intention is to examine the extent to which providing a small business with supporting ICT impacts upon that firm's strategic development context. In research objective two the focus is upon working practices. To facilitate structured discussion with regard to strategic development context and working practices a discursive frame of reference providing key dimensions of strategic development context and working practices is elaborated at the beginning of each discursive sub-section. Addressing each study objective, discussion focuses on the findings and results of the case study investigations before highlighting key areas of generic insight which represent learning points capable of informing small business development.

The chapter then concludes with discussion of the extent to which key areas of the research findings are consistent with existing understanding as embedded in the literature and to emphasise the new areas of insight and understanding that the research has unfolded.

8.2. Examination of key case study findings by study objectives:

8.2.1. Research objective 1: ICT impact on strategic development context

The focus of research objective one is consideration of the extent to which, and how providing a small business with ICT support capable of e-business functionality impacts on the strategic development context of participating small firms.

Discussion and assessment of specific study findings in this respect is facilitated by a broad discursive frame of reference. This has been elaborated from the case study analysis in the form of dimensions which potentially constitute ‘strategic development context’ activities and actions that the case study firms have or could have undertaken during the PAR process. Discussion and assessment with regard to findings relating to research objective one draws upon the following discursive summary frames of reference at differing Internet States:

- **External strategic development context (the firm’s external operating context):** The use of ICT in facilitating identification of business development opportunities – such as accessing of information which leads to strategic development opportunity (and/or understanding of constraining factors or forces that can be acted upon).
- **Facilitating owner manager strategic learning process:** Such as ICT facilitating owner manager processing of raw data or crude information picked up in the external environment so that it is contextualised to his specific small business context. Or ICT facilitating positive adjustment to owner manager existing personal constructs.
- **Enabling or facilitating enhancement of existing strategic focus of business activity of the firm; and/or considering and pursuing new paths of strategic development of the business:** For example, with regard to consolidation of existing markets, products and/or processes activities (for example, by improving efficiency or effectiveness of existing processes such as interface with and service to customers); *market penetration*: increasing market share in existing

markets with existing products; or market development: identifying and entering new markets or new market niches with existing products.

- **Nature of the firm's strategy development process and strategy formation:**
For example, discovery, choice and action as a tidy but difficult small business strategy development process – or facilitating a more creative, generative intertwined and emergent discovery, choice and action strategy development process.

E-business had a significant and positive influence on the strategic development activities within the case studies. This was in the areas of market reach, market penetration and consolidation of the participant firms' strategic positions.

New strategic development activities occurred during e-business evolution. This is important because it demonstrates the value of PAR and the research process which facilitated owner manager learning whilst the studies were progressing. In Case Studies 3, 4 and 5 the resulting strategic development actions and activities evolved during e-business development.

All of the firms had Internet connectivity and used email at the outset of this work. They all had a static web site that provided information. At the start of this work this is where most of the owner managers studied felt e-business would be of most use and how they perceived its key application. This represents Internet State 2 (publish) and is the level the researcher via PAR first engaged with the owner managers.

Initially the owner managers viewed e-business technologies as a means of extending market reach. When some of the firms evolved to more advanced Internet States of 3 and 4 they became aware of the use of e-business technology to increase market penetration and to consolidate their position.

When developing e-business the owner managers needed to feel confident about its potential before they would fully engage. This proved vital to the continuing development of the studies. Thus, involving the owner managers in the design of the system was important. It is not surprising that the design was viewed as more important than the functionality as the owner managers did not fully understand the technology. Choosing the design engaged them in the development process. This

triggered interaction with the researcher and facilitated learning and development dialogues which proved to be important in e-business development.

The owner managers understood and used the new systems to increase market presence and therefore the design of the site was an important consideration in the strategic development process at Internet State 2. They felt that to have a well designed site reflected well on them as a business. Case Studies 3, 4 and 5 felt that the new company image provided added kudos to the firm. This was felt to be important by the owner managers and increased their confidence in e-business. Design of the site and the re-branding was shown to be successful in the case studies where this was carried out (Case Studies 3, 4 and 5).

Case Studies 3, 4 and 5 also developed new activities which were included in the strategic development processes at Internet State 2. This was achieved through the use and collation of information about customers (potential and actual) via newsletter subscriptions. They could now use this information to increase market presence. New developments about the firm could be broadcast.

Case Study 3 also developed e-commerce at Internet State 3. Through the development of an on-line new “branch” they increased their market penetration. They were also selective about which stock appeared on the site. This demonstrates that they had an understanding of the limitations of transaction based e-business within their industry sector and compensated accordingly. During their strategic development processes they understood that this type of transaction would be limited and developed the systems in line with this. They also understood that the transaction history from the system would enable them to develop more effective Customer Relationship Management.

Case Study 5 also understood e-business development at Internet State 3 but used this level of technology as a relationship strategy. To arrive at a decision to deploy the technology in this manner the owner manager considered this within his strategic development processes. Thus he had some understanding of e-business at this level.

As this work progressed Case Study 3 underwent changes in its company structure that meant the head office and production laboratories were not going to be located in the same venue. Within the strategic development processes of the firm the senior management looked to e-business technologies as a means to assist them. Following

on from the deployment of e-commerce, their strategic development processes undertook an investigation of Internet State 3 capabilities. The owner managers sought through e-business how they could share and manage information and data in the new disparate locations. The shared document exchange facility adopted by senior managers was requested by them during learning and development dialogues with the researcher. They asked the researcher for a means of using e-business technology as a way of managing information access for senior managers. Their personal constructs were opened up via learning and development dialogues with the researcher to examine the possibilities e-business could offer within their strategic development processes and activities.

The successful implementation of the shared document facility enabled the owner managers to further examine e-business which led to deployment at Internet State 4. They used Internet State 4 technologies as part of a consolidation process of the firm's position. Via Internet State 4 deployment information and data are now readily at hand to facilitate strategic decision-making and development processes of the firm. Case Study 3 now has an understanding of e-business technologies at Internet State 4.

Whilst the development path to the adoption of these technologies could have been better implemented, it still evolved and the business used the technology within its strategic planning process and thus it has had a significant influence on the firm's future development path. Information and data are now more readily available to the firm. Through the use of the data that Internet State 4 technologies can provide, they are better placed to react to their external change environment. This information may have an ongoing influence on their strategic development processes.

Turning to Case Study 4 we see an owner manager who understood the technology at Internet State 2 but could not see how he could use the Virtual Learning Environment at Internet State 4. The difference in the Case Studies 3 and 4 in terms of firm's size may be important. Case Study 4 had only one location and no staff thus it may not be so obvious to the owner manager that the technology could be useful. It could have been useful for his students through facilitating actual learning process and the submission of work. This type of documentation submission is similar to the shared documentation facility that triggered the development in Case Study 3. However in this study no further development occurred.

The strategic development path of Case Study 4 followed the development of e-business at a level understood by the owner manager. This demonstrates that the strategic decision making and strategic development processes of this firm were influenced by the perception of e-business by the owner manager at the Internet State at which he perceived and understood e-business. The creation of the hub was based in his perception of e-business at Internet State 3.

However integrating the EBDP at Internet State 3 via the hub impacted upon his relationship strategies in a way he could not foresee or predict and therefore his strategic development path was hampered. His poor quality relationship strategies in the real world resulted in the hub's failure. This ultimately meant that the owner manager viewed e-business as useful to his firm at Internet State 2. At this level he was conversant with using e-business to increase market reach.

In comparison in Case Study 5 the owner manager had very good real world relationships. However the development of the hub was hampered by his lack of understanding of how the hub would impact on the firm overall. This caused the hub's development to stall. He was hesitant to develop the hub without a clear understanding of how he could manage its development. A possible fear of the resulting relationships that may have been influenced by the hub's development was a stumbling block. Thus the owner manager's strategic development processes were hindered by a lack of understanding of the implications of development at Internet State 3.

How ICT was utilized within the strategic development process was based upon the perceptions of e-business at varying Internet States by owner managers. This is rooted in the personal constructs of the owner managers. If the personal constructs of the owner managers shifted to see the potential of e-business at differing Internet States the firms evolved and adopted more complex e-business provision. When this occurred e-business became part of the strategic development process of the firm at the Internet State perceived by the owner manager. If the personal constructs of the owner managers did not adjust to provide clear perception of the value or use of e-business at an Internet State, then the strategic development processes and development path of the firm remained at the previous Internet State.

8.2.1.1. Key small business development insight

Integral to the above discussion are key areas of generic insight which represent learning points capable of informing small business development:

With regard to management of external strategic development context, it is well-documented that small businesses encounter difficulties with identifying and acting upon the uncertain operating environment in which they strive to survive. The more dynamic case study owner managers within this research have anchored in e-business in a manner which allowed a more proactive and meaningful interface with their external operating environment. This was also the case with regard to specific interface with key actors on the boundaries of the firms' activities such as customers, potential customers and suppliers.

It is indeed the manner in which e-business has been anchored in by these owner managers which appears to be important. The progressive uptake of e-business has been facilitated by a gradual unfreezing and opening up of owner manager personal constructs with regard to owner manager views and perceptions of e-business and its capabilities. A progressive recognition of what e-business could or does offer became embedded in the strategic thinking of the owner managers and thus in strategic development opportunity recognition. For example, owner manager perception of e-business in extending market reach which enables a better understanding of external environment contained opportunities. This was achieved through the building of timely and quality information from enhanced communication and dialogue with customers and potential customers. This led to the working up of this information in terms of internal business development actions that drive market penetration.

In effect, uptake of e-business has thus enhanced positive small business interaction with its operating environment. This is in terms of the actual quality of interface with key externally positioned actors and stakeholders and in relationship building and using ICT as a source of information and learning. Additionally the owner manager's participation in the e-business implementation processes itself is an 'educating process' with regard to actually facilitating owner manager identification of potential future strategic development opportunities.

Key to this manner of e-business uptake, however, is owner manager strategic learning process. Predominant within every case study (completed and uncompleted) are elements within owner manager personal constructs of frozen attitudes, lack of understanding resistance to change and fear of the unknown. Often existing perceptions of e-business severely constrained effective uptake. In Case Studies 3, 4 and 5 this was overcome by the trusted agent role of the PAR researcher which facilitated 'unfreezing' and enhancement of owner manager perspectives and worldviews as to the potential of e-business for the owner manager's firm. Close interactions between owner manager and PAR researcher, including detailed explanations and suggestions from the latter as to potential areas of e-business utility within the particular study, constituted learning and development dialogues and combined with experienced-based learning. An example of this is the owner manager's involvement in site design. This was a platform for progressive implementation of e-business which either replaced poor existing owner manager personal constructs of e-business and its potential, or enhanced current valid but surface personal constructs of understanding. Effectively, enhanced owner manager strategic learning regarding e-business and its potential resulted from provision of owner manager experience of PAR implementation - by 'bringing forward' the owner manager experience by allowing him to 'try on for size' the PAR researcher worldviews, understanding and knowledge.

Regarding the enabling and facilitating enhancement of existing strategic activity of the firm and pursuing new paths of strategic development. The PAR facilitated owner manager strategic learning process and the intertwined incremental uptake of e-business by the participant case study firms offer significant learning points.

Engaging of the owner manager in e-business systems design and implementation processes and activities has within the more progressive case study businesses resulted in owner manager feeling of 'ownership' of applications. During this selection process the close 'partnership working' with the PAR researcher, enhanced the owner manager's understanding of the potential of the e-business application under consideration and boosted his confidence.

Thus, for example, an existing strategic position has been consolidated and/or market penetration has been achieved through re-branding and image or kudos building. This

is in the eyes of customers or potential customers, with the owner manager feeling a sense of 'ownership' and understanding of the designed and implemented ICT application. This portrays him in the marketplace as a confident, high reputation business, often commensurate to highly resourced large company competitors. Importantly it is seen as tailored provision by the owner manager which underpins effective strategic development of his business.

E-business, as shown in Case Study 3, can also underpin company restructuring. It assisted with the relocation of business activities through, for instance, the sharing and managing of data and information at disparate locations. This enhanced organizational effectiveness. This new knowledge of e-business fed into the operational and strategic decision making processes of the firm. This created a springboard for new strategic development paths which enabled a consolidation of existing activities at Internet State 4.

Effective early stage implementation of e-business as facilitator of confidence building and opening up the owner manager's mind to new potential strategic development paths, sometimes even in a mode of diversification, is insufficient as impetus for pursuing new strands of small business development and growth. Within this research, those case study owner managers who have driven on into subsequent sustainable phases of development, following first stage successful e-business implementation, have demonstrated real drive and determination. They have a depth of existing knowledge about the marketplace they are striving to serve and the potential nature of the product they are to offer. If they do not have this, then they have the ability and willingness to obtain that knowledge and understanding. Case Study 4 is an example of owner manager failure to utilize early stage confidence about e-business and its potential as impetus and 'driver' for development and growth of new business activity. The successful owner managers learned how e-business needs the nurturing of abilities both of an ICT nature and with regard to their chosen business activity and growth path. Case Study 4 owner manager did not have either an ICT or business ability to seize the strategic development opportunity he had identified from his early stage phase 1 ICT implementation process, or the drive and desire to develop that ability.

With regard to the nature and form of small business strategy development processes and strategy formation, this study has unfolded interesting insight. Some academic strategic management commentators continue to propound the virtues of rational long term planning modes of strategic management. Such step management activities requires the undertaking of an external analysis to reveal opportunities and threats; an internal analysis to reveal strengths and weaknesses; and SWOT analysis to identify predetermined strategic development paths which are then implemented and monitored. Thus, such step management process involves small business identifying strategic development opportunities through tidy discovery, choice and action activities.

Within this PAR-based research study, newly identified strategic development paths have tended to be more emergent in nature. On the one hand, use of the implemented e-business has certainly enabled 'discovery' management actions and processes. For example, the anchoring in of customer information via e-business tools develops a richer deeper customer relationship. But even so it can be argued that final strategic decisions as to pursuit of new or different strategic development paths have involved subsequent acting out or 'try out' relating to potential opportunities revealed by the information initially received. Thus, 'full 'discovery' continues within subsequent learning 'actions'. On the other hand, a situation where successful deployment of first stage e-business applications has triggered off owner manager ideas as to future possible business development opportunities and new strategic directions, these new strategic activities clearly emerge from the overall e-business development and deployment process. This was not a predetermined strategic development path.

Key integral learning points here are the ways e-business tools, their design and implementation can contribute to and even facilitate small business strategy development processes. For many small businesses a tidy, linear, step strategic management process of 'discovery' revealing 'choices' and leading to 'action' is likely to be unrealistic. A lack of time, ability and resource limitations are compounded by the problem of the unknowable nature of the external environment. It is in this environment that the small business is striving to strategically manage. A more messy, yet creative and generative strategic management process is more likely to be evident in growth achieving small businesses. And it is to such a messy creative

and ‘learning ones way along’ strategic management process of intertwined ‘discovery’, ‘choice’ and ‘action’ that e-business tools at design, implementation and deployment stages can contribute, not least in terms of facilitating and enhancing owner manager strategic learning.

8.2.2. Research objective 2: ICT impact on working practices

The focus of research objective two is consideration of the extent to which providing a small firm, and how with ICT provision capable of e-business functionality impacts on the working practices of the participant firms. This is considered at different Internet States within the firms and discussion is facilitated by the following discursive summary frame of reference regarding ICT support provision impact on working practices:

- **Indicative working practices** for example relating to interaction with customers or suppliers; day-to day practices in producing goods or services; financial management and control
- **Changes in working practices relating directly to new ICT introduction**
- **Potential indirect ‘knock-on effects’ impacts on working practices from ICT implementation**
- **The issue of interrelatedness of business activities and working practices**
- **Potential limiting perspectives of both owner managers and ICT support providers and thus holistic big picture full context focus**
- **The issue of level of understanding of external operating environment**
- **Potential hurdles and constraints deriving from internal context such as staff attitudes and ability deficiencies**

The implementation and use of the Content Management System was central with regard to day to day working practices of the case studies and a key element in adoption of e-business. This facilitated e-business development in Case Studies 3, 4 and 5. The businesses used the Content Management System to increase market reach and penetration and to bolster their relationship strategies. When configuring the Content Management System all the case studies found the use of and management of

the systems difficult. The Content Management System used was complex but was required to give the functionality needed.

In Case Study 3 much of the initial work was undertaken by a senior member of the firm but the researcher finished the final configuration. In the development of e-commerce this case study was concerned about payment gateway configuration. In Case Study 4 we can see that the owner manager used the Content Management System for increased market reach and thus his working practices were changed with regard to approach and achievement of extended reach.

It is likely for many small businesses that the hurdle of learning to manage and configure a Content Management System is a stumbling block to their adoption. At this point within this study the relationship between the EBDP provider and the owner manager became important. Placing the EBDP provider in the posture of a trusted agent allowed for the owner manager to be open and honest about the skill levels within the organization. Merely providing firms with manuals did not create much success. In Case Study 3, 4 and 5 this was done and the manual was as difficult for them to understand as the systems. Clearly manuals and training have a place but a one size fits all solution did not achieve the required results. An EBDP provider may wish to undertake an audit of skills and resources within a firm. This would be best done within the boundaries of the trusted agent's relationship. The experience of these studies has shown that this needs to be done in an informal way. Simply filling out a questionnaire does not provide the required results. The owner managers studied worked best in an environment of trust and often felt embarrassed at the lack of knowledge they had.

They also had little understanding of e-business technology. This was reflected in issues of ownership. If a programme resided on their local workstation they felt it belonged to them. Locating, using and operating a programme that was not within their organization (on a remote server) meant they did not feel they had ownership of it. This lack of understanding of ICT technologies (where programmes are located) could be a potential stumbling block in adopting more complex systems.

The EBDP breaks down the traditional boundaries of the firm. Issues of ownership of data and access to data were difficult for the owner managers studied to grasp. This issue was overcome by the researcher's trusted agent's relationship. Trust and the

notion of a trusted agent are once again important in overcoming development hurdles.

When configuring the Content Management system there were other issues. To give a structure to a Content Management System an owner manager needs to have a good understanding of the firm and what they wish to say and communicate to enable the addition of content. If the owner manager does not fully understand the firm's aims when deploying e-business then the configuration of a Content Management System is more difficult because it highlights this problem.

At Internet State 2 focal activity is often dealing with a declaration of the firm's activities. This was the case in several of the studies. In Case Study 4 the owner manager had no real experience in teaching and his attempt at adding content proved difficult. This issue may be overcome by the EBDP provider ensuring that the person who configures the site is senior within the organization as they should have more idea of the focus and direction of the firm. Naturally this is dependant on the size of the firm. Case study 4 was a sole trader and the venture was a new business. As such the firm's aims were still in their infancy. This was not so in Case Study 3 but it still had difficulty in defining the firm's aims and thus had problems with placing content on the Content Management System.

In Case Study 3 the shift to Internet State 3 had an impact upon working practices due to the additional features provided by the technology. The business now has more advanced CRM (Customer Relationship Management) features. These added to the working practices of the firm. This was coupled with the integration of the e-commerce facilities which added new payment systems. These new processes needed to be added into the reporting and accounting procedures within the firm. The day to day management of the systems in phase 1 was undertaken by a manager. The manager's involvement allowed his personal constructs to develop thus giving him the opportunity to see the potential for the development in phase 2 when a far more complex ICT system was utilized.

A key change in working practices of the senior management team was based in the utilisation of the shared document facility. They used this to exchange information before they evolved to Internet State 4. When Case Study 3 evolved to Internet State 4 this had a radical effect on the firm's working practices. Through the integration of

the firm's data new reporting procedures could be used. The firm now has access to real time information which assists the senior personnel in making decisions. The working practices of employees at all levels changed. Data was now fed directly into the new system and this required training. Accountancy practices were also now integrated into the system along with stock control and sales. This represented a cultural shift for the firm. Data and information is now centralised making the collation of data much easier to manage.

At Internet State 4 the consolidation of the firm's activities can be challenging to those involved. This may create a reluctance to adopt and use the systems. This needs to be managed to avoid disruption and to gain the most from the systems potential. The senior managers in Case Study 3 did not fully consider the impact of the new system on staff throughout the firm. Thus the implementation of the system was met with some resistance that could have been overcome. Additional training was needed for staff to be able to adjust to the new systems and adopt new working practices. They also failed to consider the impact the system had on the financial practices of the firm. This was a serious omission and caused a severe disruption to the firm's activities until the firm's accounting staff adjusted to the new system.

In Case Study 4 the owner manager understood e-business at Internet State 2 and adjusted his working practices accordingly. He posted news and content to be seen and understood as a marketing tool. He could not understand the Virtual Learning Environment at Internet State 4 and thus he did not use the system. He did not adjust his working practices to incorporate this level of technology because he could see no way of doing so.

In Case Study 5 the researcher undertook the configuration and day to day management of the system. Without this the study would not have progressed. The owner manager refused to learn how this was done. He was unwilling to adapt his personal constructs and learn application management, though he was willing to adopt e-business. In this case study the owner manager used the system to enhance his relationship strategies. During his negotiations with interested parties he could use e-business technologies to enhance the product offering and thus get more sponsorship. The owner manager used the technologies he understood at Internet State 2 (DVD, SMS, newsletters) to promote the race team. He did not adopt Internet

State 3, except as a relationship strategy. His working practices were changed through the adoption of e-business within his relationship strategies.

In this research study there are firms of varying size. This is an important element in the adoption of technology and any resulting change in working practices. Higher Internet States involve the use of collaborative tools to increase efficiency. The Internet State 4 technology used in Case Study 3 collates information within the firm and was used to consolidate the firm's position. This would not be applicable to Case Studies 4 and 5 where there are very few people in the firms. Information is readily at hand due to the firm's size. Case Study 3 has multiple locations thus collation of information is more difficult to achieve. Internet State 4 technologies assisted with this. In Case Studies 4 and 5 this was not the case. This is a possible reason why any new working practices did not involve the use of data processing. Additionally, in Case Study 4 the owner manager had no real understanding of the industry he was involved in, so working practices and evolution to Internet State 4 technology did not occur.

In studies 3, 4 and 5 the working practices of the firms developed in conjunction with the strategies and development aims of the owner manager once initial hurdles to adoption had been overcome.

An important consideration for any small firm adopting e-business technology is that these systems are not static. To gain the most out of the technology, input is needed from those who manage the systems within the firm. At Internet State 2 a weekly blog or newsletter takes time to write. The amount of time it takes should not be underestimated. When using e-commerce systems a firm will have to deal with delivery agents and potentially pack and post the goods. All of this takes additional time. On line sales are also governed by regulations that need to be understood by the firm. In the studies the researcher assisted the firm with these elements. This assisted the firms to adopt new working practices and incorporate e-business within the firm at the Internet State adopted.

8.2.2.1. Key small business development insight

Within this study e-business has been shown to facilitate clear improvements in small business working practices, including the enhancing of learning and working

relationships with customers and suppliers and adjustments to day-to-day working practices along all dimensions of the businesses value chain. Some working practices relate to direct and explicit implemented ICT applications such as working interface with customers via on-line selling or promotional communication through use of newsletters. Other changes in working practices, however, are from the standpoint of the owner manager, unexpected or unintentional, due to the knock on effects of the ICT introduction which should have been but was not adequately assessed and thought through in terms of the business and its activities in their totality.

A key small business development learning point deriving from this study therefore is the need for the owner manager to constantly view his or her business holistically in terms of the 'big picture' of the firm. This holistic approach should include its interdependent activities, the marketplace and customer base which those interdependent activities serve or strive to serve.

Such a holistic perspective provides learning context for building of understanding of the precise business activities and needs that ICT applications under consideration can facilitate and development opportunities that they can create. Then the nature and form of new or adjusted working practices that proposed e-business applications directly dictate or involve can be made explicit. These can then be examined together with identification of knock-on effects to other existing working practices which will require adjustment or replacement.

The alternative scenario integral to a non-holistic owner manager approach is insular, isolationist management thinking. This may fail to accommodate consideration of key dimensions, aspects or activities within the firm. These could be vital to determining the precise nature and form of e-business applications and their potential and the form of working practice adjustments needed across the business.

Such a 'holistic' learning and development approach to e-business implementation and effective management and usage is also vital from the perspective of the ICT provider. The PAR research approach underpinning this study has demonstrated the key trusted agent role of the PAR researcher/ICT provider. Owner managers frequently suffer from frozen or inadequate personal constructs with regard to issues such as adequate understanding of ICT, technology adversity and embarrassment that

they may demonstrate to be relatively ignorant in this respect. Trusted agent status of the ICT provider enables more effective unfreezing and nurturing of owner manager personal constructs and enhancing understanding of e-business applications and their potential. It is the ICT provider 'partnership working' with the owner manager which can facilitate the 'big picture' rich detail understanding of the ICT application under consideration in the small business context in its totality. This allows for a build up of real understanding by both owner manager and ICT provider of the nature and form of requisite working practices' changes from the ICT implementation. Both in terms of working practices that the ICT provision represents per se, and in terms of knock on changes needed in existing working practices throughout the business.

In short, both the owner manager and ICT provider bring key contributing insight and perspective to the assessment process regarding the small business, its intended development path and the potential contribution of ICT. But each are also bringing limited perspective and a high likelihood of 'selective focussing' upon that part of the business or ICT processes and activities context they feel comfortable and familiar with. It is an interchange and exchange of understanding, 'trying on each others personal constructs for size', which provides synthesis of perspectives, insight and understanding. This unfolds a 'big picture' view of both the small business development potential and needs, and areas of ICT application potential and implications in terms of required working practices' adjustments. Crucially, quick in-out ICT provider assessment and implementation is likely to provide development results for the small business which fall well short of maximising ICT potential for that business.

Importantly, integral to the 'big picture contextual working frame' is the need for either an existing depth of small business understanding of the industry sub-sector and marketplace it is striving to serve or a willingness and ability to build that understanding. For example, the owner manager of Case Study 4 within this study perceived from early stage use of ICT how e-business could be subsequently used in other development areas of his business. However a lack of real understanding of the sub-sector and the marketplace and an unwillingness to gain that understanding

proved to be a major constraint to effective uptake of the identified e-business opportunity.

Moreover, embedded also within this 'big picture' understanding approach is the need for owner manager conceptualisation (within his or her personal constructs of his business if not in long-term written plan form) of the outline strategic development aims of his business in the short and medium term. Such mental frame provides the learning context for owner manager/ICT provider 'partnership working' in the build up of understanding of the nature and form of appropriate ICT development and integral working practices' impacts.

Critical for the small business is the constant striving for depth of understanding of the key factors and forces within its external environment. These could potentially enable or constrain sustaining of current core business activities and/or the progressing of the business down the owner manager's preferred strategic development path. The seizing of the opportunity to exchange owner manager and ICT provider perspective and understanding in this respect is an obvious element of the 'big picture' analysis of the small business ICT development needs.

The holistic perspective approach is also, of course, bringing focus to the internal development context of the business. Integral to which is the ability to make explicit any cultural change ('the way we do things round here') implications and changes associated with proposed ICT implementation. Included here is the ability to take on board the knowledge, understanding and perspectives of key staff whose 'learning and knowledge contribution' input is essential to determining implications of an ICT application introduction. These key staff can help determine what such implications mean in terms of requisite adjustment to company wide working practices. Such key staff involvement also paves the way for nurturing adjustment to their personal constructs, not least in addressing any reservations or fears they may hold. Critically, a feeling of 'ownership' with regard to any operational and working changes can underpin smooth transition.

Such anchoring-in of key staff learning and knowledge also emphasises the need for small business owner managers to recognise and accept that their contemporary external operating environment is so unknowable and unpredictable that the owner

manager alone cannot do all the learning necessary about that environment to effectively nurture sustainability and growth of the business.

Finally, the progressive holistic build up of understanding facilitates determination of resource and ability requirements and of associate training and development needs within individuals. Small businesses are in no position to offer and provide staff training for training's sake (as is the case in many well resourced large companies). 'Partnership working' between owner manager and ICT provider in the build up of holistic understanding can provide the rich detail of understanding of the ability strengths and deficiencies of key staff with regard to effective implementation, management and use of ICT applications under consideration. This will assist with the design development and delivery of appropriate training to nurture requisite staff capabilities and understanding. In total, the message is that of a need for a contextual approach to ICT provision within small businesses in contrast to common tendency for isolationist, non-holistic assessment of ICT needs and quick in-out implementation.

8.2.3. Research objective 3: ICT security implications

The focus of research objective three is to determine the ICT security implications of a firm undergoing e-business development. This is considered as they migrate through the Internet States. The following discursive summary frame of reference is used to facilitate discussion.

- **The use and management of the EBDP –by the provider:** Location of ICT services; how and where data is processed; control of functions; adoption a holistic overarching security policy.
- **The use and management of the EBDP –by the firm:** Management of users; selection of applications.
- **E-business evolution and migration:** The use of software and hardware; internet connectivity; issues relating to legacy systems; transitional security policies.

A key element in enabling the secure facilitation of e-business within the case studies was the shifting of the location of ICT services to the EBDP. The more complex ICT

systems used were managed by the researcher utilising the EBDP. This enabled the firms to adopt new business processes and procedures that were outside of their ICT skill set and core competences. It would not have been possible to undertake the research without shifting the location of the ICT services due to the lack of ICT provision in the studies. This was an inductive supposition by the research team at the outset of this work.

Using an EBDP it is the ICT architecture, applications and services that combined to satisfy the e-business needs of the case studies. Management of e-business security needs to encompass all of these elements. Identifying where business functions and processes operate, and hence the location of the applications, assist in designing suitable security models.

Using this methodology it is the EBDP which manages and carries many of the ICT security risks. This was understood by the owner managers who relied on the researcher using the EBDP acting as a trusted agent to secure the system. To achieve this, the EBDP needed to have system wide considerations.

Many security policies examine parts of a security problem. For example, they may examine software and consider how it can be exploited. Software only forms part of the EBDP. Other issues such as potential breaches in network connectivity and hardware exploits need to be considered. The shift in the processing of data and information from inside the firm to the EBDP mean that initially only the e-business provider is capable of achieving the overall perspective needed to ensure that e-business security needs are met. Thus an EBDP can address security policies, not in terms of each individual application, but using a holistic approach which encompasses the ICT architecture, applications and services.

An EBDP provider has an overall perspective which allows for business functionality to be addressed as a primary concern in terms of ICT security. Using an EBDP an important consideration is who controls functionality. These functional needs have different levels of security exposure to users of the systems (employees, customers and suppliers) and thus create policies according to the firm's relationship with them. Many of these considerations were undertaken by the researcher, thus removing the need for the firms to manage these security needs.

Through moving the location of the business functionality from the firm's ICT many of the ICT security needs of the firm are also removed by placing them within the EBDP. This work has shown that this is best managed through the relationship the e-business provider has with the firm through a trusted agent's relationship.

8.2.3.1. Small business ICT security insights.

This work has shown that an EBDP can assist a firm to effectively manage ICT security issues during e-business evolution. The work of Daniel et al., (2002) and Tapscott (1996) suggest that e-business growth, like small firm growth generally, tends to be non linear and does not conform to a step-by-step approach. Some firms are now behaving in an 'instant international' or 'born global' sense, where the stage-by-stage progression is now redundant (Knight and Cavusgil, 1996; McAuley, 1999). An EBDP can assist those firms without the appropriate skills and ICT infrastructure by providing an instant platform for e-business growth encompassing ICT security.

Not all firms though are "born global". If we examine Case Study 3 we see that at the outset of this work the firm uses an ISP and has a static web site and email facilities (Internet State 2). We see a firm in the process of transition and having databases on local computers in the branches and head office (see Figure 11). Using the EBDP the firm developed an e-commerce system moving to Internet State 3. The synchronization of this data with the e-commerce facilities caused security and operational issues. The databases on the local workstations were not capable of establishing a secure connection with the EBDP.

This raised an important consideration in the evolution strategy of e-business in small firms, the issue of the legacy systems. The framework and check-list prescribed by EURIM do much to secure a firm from being vulnerable but do not address a firm in transition. We have the traditional models of firewall and anti virus, etc. that will secure static systems and were acceptable to Case Study 3 at Internet State 2 but not at Internet State 3. The owner managers resolved this issue by moving to Internet State 4 using a specific industry application and were able to move data away from the local workstations completely.

Although the e-business evolution did not occur at the move from Internet State 3 to 4 using the EBDP, the PAR elements of the platform and the trusted agent's status enabled the firm to utilize elements of the EBDP for knowledge and as a resource for developing their e-business needs. Importantly once the researcher acting as a trusted agent exchanged dialogues with the owner managers and the new ICT provider, the firm felt reassured about ICT security. They used the PAR elements of the EBDP to evolve e-business within the firm and ICT security. The firm then trained a senior member of staff to understand and manage ICT security within the firm at Internet States 2 and 3. The notion that ICT security was a "mystery" had been removed and thus they felt more confident about evolving to Internet State 4.

Growth of ICT systems means uncertainty for the firm in terms of security and wider operational considerations. Implementation of e-business models and effective security is based on designing solid and robust ICT business systems. This is where an EBDP provider is of benefit. Managing ICT security risks was beyond the skills of the owner managers in these studies. The PAR elements of the EBDP allowed the owner managers to engage in learning and development dialogues which enabled them to feel confident the systems were secure.

The ICT elements of the EBDP have many components. One example is the operating system, being common to many users thus having common areas of risk. The solution is for auto update direct from the OS vendor, which should remove the onus for security of this level from the inexperienced end user. Likewise generic applications, with exploitable code errors, should be the responsibility of the provider. Bespoke applications will be more difficult to update depending upon the contract and relationship with the developer.

	Network provider (ISP)	EBPP	Software vendor	Owner manager
Web site operating system		X		
Workstation operating Systems		X	X	X
Web server email server		X		
Generic web applications		X		
Anti-virus	X	X	X	X
Industry specific applications			X	
Data backup		X		X
Organization specific applications			X	

Table 26 E-business security management deploying an EBDP.

Table 27 shows the spread of responsibility for exploitable risks using the EBDP. The problem is the co-ordination of the security policies. The firms were able to use a generic package of core system services complete with security provided by the EBDP. This leaves any industry specific software to be provided by a specialist applications vendor as was used in Case Study 3.

Through examining what ICT services are provided by the EBDP it is possible to determine the responsibilities of the EBDP and the firm. There is responsibility for some functions, such as the configuration of email (setting up accounts etc), where the owner manager provides multiple email accounts for users. In most cases this would be the responsibility of the firm.

A dynamic website hosted on the EBDP could be vulnerable to a Denial of Service attack. This risk would be managed by the EBDP provider. Public and user access rights to the Content Management System would be the responsibility of the firm. Knowledge of how this is achieved is provided by the EBDP provider acting as a trusted agent in learning and development dialogues with the owner manager. These dialogues and exchanges need to be fluid as security policies are not static and are constantly changing to address new threats.

Thus the key to an effective security policy using an EBDP is frequent exchanges between the EBDP provider and the owner manager. During these exchanges the EBDP provider needs to be careful not to overburden the owner manager with too

much information which may for example create a “frozen attitude” in the owner manager’s personal constructs. This is where the PAR elements of the EBDP hold value, the development of the security policy can be addressed within the boundaries of the relationship with the EBDP provider.

Internet States	Applications	Location of Services			
		Email	Web browsing	Web server and site	RDMS (database)
1	Email, Hosted basic website	EBDP	Local	EBDP	None
2	Email, Complex website	EBDP	Local	EBDP	EBDP
3	Email, dynamic transaction processing website with shop/sales functionality	EBDP	Local	EBDP	EBDP
4	Email, web shop presence linked to internal systems	EBDP	Local	EBDP	EBDP
5	Email, website linked to business suppliers	EBDP	Local	EBDP	EBDP

Table 27 Location of ICT services using an EBDP

When implementing the EBDP a shift in e-business services occur. Table 28 shows that by moving the position of the services the responsibility for security falls to the EBDP provider. In this scenario it is viable for a firm to reach at least Internet State 3 or higher with very basic in house ICT provision.

This security model is suitable for firms going through e-business development because the ICT services from 1-5 are located and managed by the EBDP. This protects the firm from any potential exploits as they migrate through the Internet States.

This security model is only effective if it is coupled with the other elements of the EBDP. It is the learning and development dialogues via PAR that raise important security issues that the owner manager needs to manage. These could be user and password management. It is the combination of these elements that creates the provision of ICT security as part of the EBDP.

Generic functionality may also be provided so that the EBDP provides a range of additional services allowing the firm some flexibility in the selection and design of the final applications and thus e-business evolution. This may be offered by using

generic Content Management Systems and e-commerce applications which the owner manager can then configure to their own needs.

An EBDP can empower the firm to develop its own systems by removing complex installation and configuration as the researcher did in these studies. Thus the role of the EBDP provider may take a number of routes depending upon the needs of the firm. The studies show that the location of services and who manages them impacts on the security needs of the firms. The EBDP manages the overarching ICT security needs during these developments.

The Internet States give a direction of growth in e-business. An EBDP provider could examine this in terms of the firm's current Internet State. This could create a road map for expansion based on the needs and plans of the firm. Successful management and expansion of e-business depends upon the relationship between the owner manager and the EBDP provider. This relationship is based in the trust between the two parties and hence the degree of responsibility which the owner manager will hand over to the EBDP provider. With sufficient trust between the two parties the EBDP provider can deliver a range of generic configurable applications (e.g. content management systems) for the firm to manage the functional use without concern of the initial configuration and security.

This may only happen if the owner manager of the firm is willing to look upon their relationship in a different way to existing ISPs who simply sell connectivity and Application Service Providers who wish to sell a business solution. The EBDP provider supplies a modifiable systems solution where the two parties work together. ICT Security is a moving platform and the EBDP security policy will be based upon the range and location of services and data. Using an EBDP, internal data and applications may be protected more easily than those that require access from external locations, be it by company staff or by customers' suppliers.

As evolution through the Internet States occurs the external location of applications and storage of data provides a greater risk to the system. For example in Case Study 3 it can be seen that at Internet State 2 no information about stock was held on their website. As they moved to Internet State 3 through the use of e-commerce a shift occurred where important data was held on the EBDP. EBDP management can provide security support within its services during this time.

Also the EBDP and the relationship between the researcher and the owner manager enabled Case Study 3 to solve the problems of the disparate local databases in each branch by evolving to Internet State 4. At this Internet State all the information was held in one place thus solving security and data updates. When moving from Internet State 2 to 3 they could have viewed the problems of database integration as a hurdle to adoption. Instead they engaged in learning and development dialogues via PAR and progression to Internet State 4 occurred. This was not as smooth as it could have been due to variances with the firm. However, they attempted to solve the problem via e-business development as opposed to turning away from e-business. Thus PAR can be seen as an integral part of e-business development in terms of ICT security.

Using an EBDP a firm can be *gradually* empowered to manage their own applications which may encompass ICT security. This is achieved via PAR and the trusted agent's status of the EBDP provider. The level of empowerment and the degree of control handed back to the firm in terms of e-business provision may differ for each firm. Thus e-business security models using an EBDP should be assessed on a firm by firm basis.

8.2.4. Research objective 4: Internet States and relationship strategies

The focus of research objective four is to consider the extent to which, and how providing a small firm with ICT provision capable of e-business functionality impacts on the relationship strategies of the participant firms. This will be considered within the parameters embedded within the following discursive summary frame of reference:

- **The deployment of the EBDP and possible new ICT based relationship strategies:** relationship strategies of the firm at different Internet States.
- **Relationship strategies in hubs and networks:** by the firm; by the EBDP provider.
- **Potential EBDP relationship strategies with the firm:** at differing Internet States.

Many academics involved in small business research agree that relationships are vital to firms. Fuller's (2003) work addressed the issue of ICT relationship strategies by using the term networked PCs. It is now possible to examine this term in more detail through the examination of the case studies at differing Internet States. The use of the EBDP moves functionality away from the user's personal computer and many services are located on the Internet. Thus it is the EBDP that is providing the services that facilitate some of the relationship strategies utilized.

8.2.4.1. Internet State 2

Email was used by all the firms at the outset of the study. This is now viewed as a standard means of communication. At Internet State 2 web sites are used as an information portal. Basic CRM functions may offer newsletter subscription and product sheet downloads. It is therefore possible to engage in the collection of data that assists with new businesses development and informing current customers and clients of events and offers. At Internet State 2 many actions that follow are not based within the EBDP but may be followed up via other means, such as telephone and or face to face interaction.

At Internet State 2 the design of the systems can play a key role in the relationship strategies of the firm. The look of the web site can have an impact on stakeholders and competitor firms. This can be in a positive or negative manner. A poorly designed web site can create a poor image of the firm and good design increases confidence in the firm. Good design was seen as a key component of successful e-business development in all completed case studies. They used the new look of the sites to increase the firm's stature. They now felt they had adopted e-business technologies and used this as a marketing tool inside and outside of the firm.

This was highlighted in Case Study 5. To raise the profile of the motor sport team was considered to be of value when attracting and keeping sponsors. In addition to the new design other means of developing relationships were utilized at Internet State 2. The sponsors' kudos increased by the use of the EBDP and by using sponsors' logos on DVDs. The new means of collaborative marketing created by e-business technology increased the market reach of all involved. In Case Study 5 we can see that there is a new and added depth to market penetration. This is with the sponsors

and the team increasing B2B interaction and the formation and strengthening of relationships and new online relationship strategies. It is the EBDP providing links to other sponsors' sites.

This strategy of joint promotion is not unique to ICT and often occurs within magazines and the sports industry. A motor sport team may well put an advertisement in a magazine with the sponsors' logos. These logos though in magazines are images and cannot be clicked through to the sponsors' web sites as they can on the DVD, web site and within e-newsletters. This gives a new richness to the sponsor/sponsee relationship.

Fuller's (2003) notion of strategic development and the reciprocal relationships with stakeholders who share a common goal perhaps best defines what is occurring. The use of banner advertising reciprocal links via web sites give added depth and richness to the use of sponsors' logos in several case studies. The use of these goes deeper than their use in magazines, the links involved and the ability to collate information gained from visits and how users enter and leave sites gives more data to all parties via reports from the EBDP.

In Case Study 5 we also see the use of SMS messaging systems used to provide news about events. This technology was easily adopted by the owner manager. It can be defined as an Internet State 2 technology because it provides information and no interaction occurs with the recipient of the message. All completed case studies understood how to utilize e-business technologies at Internet State 2.

8.2.4.2. Internet State 3

At Internet State 3 more complex ICT business processing occurs. At this Internet State financial transactions may occur. This involves payment gateways and automated purchasing of goods. In such cases the EBDP needs to be able to manage the inputs from the customer, the payment gateway and the firm. Each element must be configured and synchronized to work together. Case Study 3 found this a hurdle to adoption. It was the researcher who completed this process. The firm created the accounts needed with the payment gateways and the researcher who configured the systems. At Internet State 3 a firm can engage in e-commerce as an automated

process. This may have an impact upon the firm's relationship with its clients and customers.

Case Study 3 has a good reputation for personal service and e-commerce systems may not allow for the interaction that it would normally provide to its customers. To address this issue they only sold generic goods on line (sunglasses etc). This avoided potential problems whilst increasing the firm's market reach. All the case studies who engaged in e-commerce now have a record of past purchases from customers within the EBDP. These can be used to determine future business development opportunities as well as gaining a better understanding of the client's needs. E-business at Internet State 3 can impact upon the relationships a firm has with suppliers, agents, distributors, competitors, and customers (potential and actual). The increased efficiency of ICT systems means that time is saved. This allows firms to develop deeper and potentially more learning-oriented relationships with those it engages with.

It is possible and often normal for an owner manager to strengthen these relationships during the course of day to day business. However there is a danger that these relationships may become isolated through the efficiency of e-business. Fuller (2003) suggests that owner managers will need to devote more time to sustain and manage relationships when e-business evolves in the firm. The interactions that would have occurred previously through the sales process may not now happen and the owner manager needs to be aware of this and compensate accordingly. This was confirmed in this study.

One firm, Case Study 5, was not interested in the sale of goods. The owner manager used the advance into e-commerce as a relationship strategy to raise the profile of the team.

8.2.4.3. Relationship strategies hubs and networks

Gray (2003) in his Newtime study has classified hubs, clusters and associations. Outside of the issues of connectivity Gray does not discuss the role of the ICT provider. It is assumed that the ICT provider is a silent partner providing the connectivity. This study suggests that the role of ICT provider is important in some networks, not just in the provision of services but when they are an active

participant. This work examines these issues beyond the notion of being an e-trust platform provider (Lockett and Brown 2006) as the firms are active participants.

The hubs and networks that were attempted by Case Studies 4 and 5 were based at Internet State 3. The possible success or failure of these hubs was based around the relationships and relationship strategies of the firms and owner managers. The studies demonstrate that the status of the current relationships the firm has is crucial to the effective implementation of a hub.

This can be seen in Case Study 4 where the adoption of the hub by other firms became difficult. In Case Study 5 it can be seen that the owner manager did not progress the development of the hub because of a lack of understanding of how it could impact upon his current relationships. The owner manager of Case Study 5 has successful offline relationships and was hesitant to bring these into e-business without fully understanding the implications. This was the case even within the boundaries of a trusted agent's relationship.

In both cases the firms needed to understand the impact the hub may have on current and new relationships with the firm and others. Without this understanding the development of hubs will be difficult. The relationship strategies needed to create and manage the hubs in this work were not initially based in e-business but in real world relationships. It is not possible to determine fully the relationship strategies needed in hubs and networks because neither was completed in this study. The relationship strategies required to set the hubs up were based in "real world" relationships that Fuller has already discussed.

To fully understand the development of hubs the addition of EBDP provider needs to be understood and how this impacts on the firm's wider relationship strategies. The owner manager may not be aware of these factors and it may well fall to the role of the EBDP provider to nurture the firm through these growing pains. The EBDP provider may choose to actively participate in the formation of the hub. Fuller (2000) suggests that firms grow in a zone of evolution. This needs to be understood by the EBDP provider to enable these relationships to be managed effectively. All the firms in the hub need to grow together.

To achieve this, the EBDP provider may need to extend the role of the trusted agent from the focal firm and needs to be perceived in this role by others in the hub. The EBDP provider needs to understand the relationships the focal firm has and how they manage these when creating the hub. This has an impact upon the strategic development paths of all parties. The focal firm needs to ensure the objectives of the hub are managed in a way that facilitates all members and the EBDP provider must have an understanding of how the focal firm is perceived and understood by other firms. This understanding will allow the EBDP provider to be seen as a facilitator to all parties.

8.2.4.4. Internet State 4

The work has shown that the primary focus of relationship strategies should be internal when evolving to Internet State 4. In Case Study 3 where Internet State 4 was reached and implemented major changes in working practices occurred. The evolution from Internet State 2 to 3 was done via the EBDP. The move to Internet State 4 was done via an external ICT supplier. This was due to the specialist nature of the business and the required e-business processing. Management of patient data and stock control is now managed centrally.

Outside of the enterprise nothing appears to have changed. The e-commerce facilities provided at Internet State 3 allowed for more effective CRM. The e-business development at Internet State 4 impacted internally within the firm. The relationship strategies needed by the owner managers should address the cultural shift that the change in working practices bring about. These changes in working practices were not initially managed well by the firm's owner managers. It was only after the event that they realised the impact on working practices.

Developing a more effective relationship strategy with its staff would have enabled the changes to be better understood and managed. These relationship strategies are with those within the firm and its stakeholders and are not new in terms of Fuller's (2003) work.

Case Study 4 also attempted to adopt Internet State 4 technologies through the use of a Virtual Learning Environment. In Case Study 4 the clients or students were those

that were to use the system at Internet State 4. This was through the submission of work and the use of collaborative tools. This could have developed into a range of internal business processes for the firm through the use of an “online” school environment. This never occurred.

Internet State 4 may only be attractive to a firm that employs staff in multiple locations. Case Study 3 has several locations and employs 35 people. Case Study 4 is a sole trader. Thus even if the more advanced Internet States had been adopted (outside of the Virtual Learning Environment) for intra processing, this may not have proved useful. Case Study 4 can manage its intra business processing easily due to the micro size of the firm.

The owner manager was also not capable of delivering the required relationship strategies. He could not communicate effectively with his students at Internet State 4. It was therefore not possible for his students to see the value or benefit of the system and this may be one reason for its non adoption. Other factors discussed earlier also play a role. The important issue highlighted here is that the development path of the firm is seated in Internet State 2 and 3 technologies. Thus the firm’s relationship strategies reflected this. The owner manager was capable of delivering the required strategies at Internet State 2. The use of the Content Management System enabled him to effectively engage in CRM and created a new development path for the firm which led onto phase 2 of the work at Internet State 3. The owner manager’s perception of the technology did not allow him to see the potential of the technology at Internet State 4. This view may have been compounded by the firm’s size.

Thus e-business can be limited by the perceptions of the owner manager. If the owner manager of the firm cannot engage with the technologies at the required Internet State then the system may meet problems of non adoption. The required relationship strategies and the strategic development paths of the firm need to be in line to effectively implement and manage e-business at the required level.

8.2.4.5. Small business relationship strategy insights

Integral to the above discussion are key areas of insight which represent learning points capable of informing small business development regarding the EBDP provider's relationship strategies with the firm.

Based on the experience of this work, the following summarises the relationship strategies that an EBDP provider may chose to adopt when engaging in e-business deployment with a firm. Deploying an EBDP raises awareness of the potential of e-business. The role of PAR and the engagement with the owner managers in learning and development dialogues is important.

In Case Study 1 we see that the firm's e-business development potential was hindered by the researcher being viewed as seated within the customer supply chain. Thus it was the owner manager's relationship strategy with the researcher being viewed as an ICT supplier that impacted upon his development of e-business within the firm.

His learning and development potential was hampered because the owner manager was considering wider operational and cost issues that were not part of the research process. Although he used the researcher as a knowledge base to inform him of potential e-business applications within the firm this was limited. He gained some knowledge then proceeded to place his personal constructs back into his perceived negotiation position of dealing with a supplier. This is interesting because it confirms Wyer's (2003) notion of owner managers seeking information from key informants (in this case the researcher acting as an ICT supplier) but demonstrates that this learning can be limited by the relationship strategy it is seated in.

Once the owner manager had gained some knowledge, he ceased the learning and development process with the researcher. He may have returned to the researcher for future learning once he had time to absorb the ideas. However the researcher then encountered a "freezing" of the personal constructs of the owner manager. This may in part be due to fear of learning or fear that further engagement in the learning and development process would increase his purchasing of ICT. He felt more comfortable seating the relationship in the customer supply chain where he felt he understood the "rules".

In Case Study 2 ethical issues played a key role in the cessation of the study. Placing the researcher in a position that could potentially breach the ethical rules of the study severely hampered the relationship.

Therefore the relationship strategy of the owner manager with the researcher had a direct influence on the development path of the firm in developing e-business. Wider developmental issues could also have played a part. The owner manager in Case Study 2 had new roles and responsibilities and these may have been alien to him. It was the first time he had engaged in ICT and e-business development. His fear of engagement with the researcher demonstrates that he may have been experiencing frozen personal constructs. He could simply be afraid of ICT development. He also had the notion that the development path of the firm could incorporate the researcher into his organization.

The first two studies demonstrate that the relationship strategy of the e-business provider is important when developing the necessary learning and development dialogues that may influence the strategic development processes within small firms. However there is an important caveat that needs to be stated. The case studies were sought out by the researcher and thus the firms may not have been directly seeking the development of e-business. It came to them as a “bonus” of the research process.

Had they been actively seeking e-business development they would have sought out e-business suppliers and may have been more open to the learning and development dialogues. The researcher though feels this is doubtful. In Case Study 1 the owner manager did not engage in learning and development in any meaningful way despite viewing the researcher as seated in the customer supply chain as any potential e-business supplier would have been. In Case Study 2 the primary hurdle to adoption was based in ethical issues which had a direct impact upon the owner manager’s relationship with the researcher.

Thus it was the relationship strategies of the owner managers that excluded the researcher from the strategic development processes in the first two case studies. E-business therefore could not develop in any meaningful way that was incorporated within their strategic planning.

Whilst there were specific issues within the first two studies that meant the researcher and the research process of deploying the EBDP was hampered, the relationship

strategy of the researcher should not be excluded from scrutiny. The research team met to discuss these issues. It was clear that the researcher was meeting hurdles to undertaking the study. An analysis of the first two studies demonstrated that in Case Study 2 accountants are viewed as not being external to the firm. Seated within the firms extended enterprise (as previously discussed) they were privy to the strategic decision-making and strategic development processes and paths of their clients.

Therefore seating the EBDP within the firm's extended enterprise could facilitate the research process. Several things needed to happen to achieve this. Firstly the researcher needed to engage with senior members of the firm, ideally the owner managers. This had been done but the results still remained elusive. The research team also felt engagement with owner managers based solely on e-business development did little to help the research process. Wider engagement with the firm's development activities would enable the owner manager not to feel isolated from the research process. It was possible that the learning and development dialogues that had occurred were hampered by the owner manager's inability to foresee how e-business development was applicable to the firm's overall development.

The research team therefore decided that e-business development could be better facilitated by the researcher engaging with the owner manager on a wide range of issues. Through the facilitation of these dialogues it may be possible that the owner manager's personal constructs would be more open to the development of e-business. Therefore it is the EBDP seated in the extended enterprise which may allow the strategic development of the firms to incorporate e-business technologies. And the engagement with the researcher in learning and development dialogues which may shift the personal constructs of the owner manager to be able to see the potential of e-business. In the case studies that followed this proved successful.

Building on the facilitating elements of the analysis used in this work it is possible to highlight potential relationship strategies needed by an EBDP provider as they work with a firm that evolves through the Internet States. This work has shown that this would be most effective couched in a trusted agents relationship. To achieve this, the EBDP provider needs to have an understanding of the strategic planning and development processes of a firm. This work has shown that the strategic

development path of the firm and the relationship strategies to successfully deploy e-business are linked. In this work some of the firms studied evolved from Internet State 2 to 4.

Naturally not all firms may wish to evolve e-business beyond a certain Internet State. It may not be desirable for several reasons. Some firms may not wish to grow or consolidate their position. Many small firms are “life style” businesses, in which the owner manager’s are content to just to tick over. In those firms that wish to grow or increase efficiency then e-business evolution may assist.

8.2.4.6. Potential EBDP provider relationship strategies at Internet State 2

A key benefit of Internet State 2 technology is an increased market presence. Therefore the EBDP provider and the owner manager could examine the strategic aims of the firm and determine if an increased market presence is desirable. If this is the case then they should seek to align the strategic development path of the firm with Internet State 2 technology.

When deploying Internet State 2 technologies a multi page web site can be used. It is primarily used as an information portal. Any transactions that occur are facilitated by other means, phone fax etc. Firms wishing to adopt this level of e-business may need to be aware of the following to gain maximum benefit.

Public Relations are a key element of Internet State 2 technology. The site can publish news about the firm, any special promotions they may be offering and key figures in the firm should be encouraged to publish blogs. In conjunction with product leaflets, enquiry forms could be offered that enable users to subscribe to a newsletter. This can then be used to increase market presence. An important area of publishing a web site is the configuration Search Engine Optimisation. This means how a site is listed and managed in search engines. The creation of Meta tags which facilitate this searching is a specialist skill and may need to be undertaken by the EBDP provider.

A key driver at Internet State 2 is an increased market presence. This work has shown that good web site design increases the adoption of e-business within the firm. It also adds value to market presence by displaying advanced technology to

customers, competitors, stakeholders and those employed by the firm. This enables public relations to be bolstered by Internet State 2 technology.

Ongoing inhibitors at Internet State 2 could be that a firm may underestimate the amount of time needed to update the site with fresh content. Key Figures in the firm may also be unwilling to write a blog. They may feel that they have enough to do during their working day and this additional task can be seen as not giving an immediate return for the time invested.

To overcome these issues the EBDP provider needs to make the firm aware of the full implications of deploying Internet State 2 technology. Thus, additional working practices will need to be adopted by the firm. Aligning these with the strategic development aims of the firm and incorporating them within the firm's development path increases the value of the technology. The firm can now use Internet State 2 technology as part of the strategic development path for increased market presence.

8.2.4.7. Potential EBDP provider relationship strategies at Internet State 3

A key benefit of Internet State 3 technology is increased market reach and penetration. Goods can be sold online via an e-commerce system. Often though not always, the technology development path of a firm evolves from Internet State 2 to 3. As already discussed some firms can be "born global". In this work all the case studies evolved from Internet State 2 to 3. To achieve this they moved their "static" web sites to the EBDP. They joined the EBDP at Internet State 3.

This migration avoided to some extent the need to explain that static web sites cannot perform the interaction needed to facilitate Internet State 3 transactions. If the evolution had been performed on the case studies' existing ICT systems then evolution would have been more complex.

Therefore migration to the EBDP could be a key strategy for a provider when working with a firm. If a firm only wishes to engage at Internet State 2 then elements of the platform are not utilized. This allows easy growth and development into Internet State 3 and beyond at a future date.

Importantly the EBDP provider can focus on the strategies and development path of the firm as opposed to dealing with technological hurdles. Through the developing relationship the EBDP provider has with the owner manager via PAR, they could identify if increased market reach and penetration is desirable for the firm. If this is the case then the evolution to Internet State 3 may be a viable proposition.

Internet State 3 technology contains all the attributes of Internet State 2 plus the additional features of e-commerce. All of the features of Internet State 2, blogs, news, etc could be utilized to bolster and facilitate the e-commerce systems. The addition of e-commerce will develop new working practices for the firm. These include management of online stock. Any stock control systems and staff involved need to be aware of the e-commerce system. They may now be involved with the packaging and delivery of goods which may be a further new working practice. The possible new relationships with delivery agents need to be incorporated into the e-commerce system to complete the online transaction. The EBDP provider may assist with integrating this.

A particular focus could be paid to the configuration of payment systems which involves e-business security. The firm's accounting and financial systems may also need to incorporate new working practices that include online sales. The exporting of sales data from the e-commerce system needs to be managed so that it is compatible with the firm's accounting systems.

All of these elements may become inhibitors to adoption of e-commerce. Overcoming these hurdles may be best managed by the EBDP provider and the owner manager working together. Together they could create a strategic development path where these potential changes to working practices are integrated into the firm as seamlessly as possible.

Internet State 3 technologies also have additional benefits for a firm. When engaging in e-commerce there may be additional features such as bulletin boards that allow user feedback about goods and services the firm sells. The literature offers several views on this. Hagel and Armstrong, (1997) and Hagel (1999) suggest that on line communities bring consumers closer to the firm and thus enrich

the relationship. However, Brynjolfsson and Smith (2000) feel there is no reason to return to a site if one can get the goods cheaper elsewhere.

Importantly, the more advanced use of Customer Relationship Management now includes purchase history and feedback from customers. What this study has shown is that the use of Internet State 3 technologies can make information readily available to the firm. This will assist the firm in understanding its clients and customers better and can influence the strategic development path of the firm.

It may also provide information about the firm's external operating environment, through increased interaction with users. Assimilation and the collation of this information may be beneficial to the firm. Through the use of Internet State 3 technologies the business now has an additional source of information. A key area the EBDP provider may choose to highlight is the use of these data and integrating it into the strategic development processes of the firm. In doing this the evolution to Internet State 3 may have an influence on the strategic development path of the firm.

Hubs and networks present difficult challenges for the EBDP provider. This study has shown that the focal firm's reputation is a key component in the creation of a hub or network. It is vital that the EBDP provider ensures that the firm has a good reputation prior to commencing. Even if this is the case additional hurdles can present themselves.

In this work the owner manager of Case Study 5 was unwilling to implement his personal contact network into a hub. He did not fully understand the technology or the implications of doing so. He therefore hesitated causing the creation of the hub to stall. Hubs and networks require a deep level of trust to develop and this takes time. An EBDP provider may want to work with a firm over a period of time before attempting the creation of a hub.

It is also very important that the EBDP provider establishes a relationship with other firms in the hub and is seen in a positive light. These multiple relationships could be difficult to manage. There may be issues of loyalty with the focal firm. Other participant firms may see the EBDP provider as only having the focal firm's

interest at heart. This may require the EBDP to be seen to be at a distance from the focal firm and this may hinder PAR.

It is a conclusion of this work that an EBDP provider working in partnership with a firm to create a hub would be very difficult to achieve successfully. This does not exclude the EBDP provider setting up a hub or network where they are the focal firm. This may result in many of the problems experienced in this study being overcome.

8.2.4.8. EBDP provider relationship strategies at Internet State 4

The strategic drive of Internet State 4 is consolidation and ability to springboard the business along any subsequently identified strategic development paths from that base of effective consolidation. Within this study Internet State 4 technologies were the most difficult to integrate and manage within a firm. A key element of Internet State 4 is to integrate internally. To achieve this many of the processes that were undertaken manually or on local workstation are now processed centrally. This can be located inside or outside of the firm.

Processes and activities can now be undertaken electronically. This increases efficiency and dramatically improves the amount of data and information available to the firm. Often accounting and financial systems are impacted upon changing the way the firm manages this type of transaction internally.

Firms may have Internet State 4 technology without adopting Internet State 3. They can evolve from the lower States of 1 and 2 and bypass the adoption of e-commerce.

Incorporating Internet State 4 technologies within a firm can involve a major cultural shift. Many working practices will change and this often necessitates the training and development of staff. Costs to the firm are not just based within the e-business technology but should include training and development. Staff will also need time to adjust to new working practices and this may be challenging. This needs to be understood by the firm and the owner manager.

An important area of focus for the EBDP provider may be the changes that will occur in the firm with Internet State 4 deployment. Assisting the owner manager to overcome these issues will be a key area of successful transition. The transition process should begin within the strategic plans and intended development paths of the firm.

It is crucial that e-business evolution occurs at the strategic planning stage, whatever form effective strategy formation and planning may take within a particular small business. Full consideration of all the issues that can present themselves at this point will enable a smoother development path and transition. Management of staff is vital to ensure success and to avoid a backlash or rebellion against the system. These hurdles may be overcome in time but the transition can be made easier by an understanding of what the firm will go through.

An EBDP provider could also be involved at the strategic development stage for the following reasons. Internet State 4 technologies through the collation of data and information provide real time information to the firm. Many elements of management reporting are now much faster enabling the firm to react much quicker to changes that occur in its external environment. This may not be apparent to an owner manager when considering a move to Internet State 4. These technologies can have a direct bearing on the strategies and plans of the firm. At Internet State 4 they can react much faster to events. Therefore this level of technology not only enables the firm to consolidate its position through cost savings but also enable them to react much faster to new events or situations.

This work with its use of Personal Construct Theory shows that the real source of competitive advantage of a small business is the willingness and ability of the owner to identify snippets of external change environment facts and insight and to undertake ongoing learning activities (this may include experiment or 'try out' activities regarding understanding if the change situation incorporates product or market development opportunities). Thus, ICT may make 'information' potentially available to all firms. However only a few owner managers have the ability to convert facts/insight into information, which can inform effective strategic development behaviour within the small firm.

An important finding of this work is that it is not possible to identify which or all “snippets” of information or data than influence an owner manager. An owner manager’s personal constructs may be influenced by information, events or data that are not apparently important to anyone else. These may have an impact upon the owner manager and thus the firm.

Therefore one possible key relationship strategy for an EBDP provider is to be aware of the changes in the personal constructs of the owner managers in relation to e-business and the firm. Not all of the shifts in the owner manager’s personal constructs may be useful. The EBDP provider as a trusted agent can act as a “sounding board” for the owner manager and engage in dialogues which enable these new ideas or concepts to be discussed. The EBDP provider can then examine the technical considerations (if any) of the new ideas and through a development dialogue establish e-business viability. If a new development is to occur then a discussion on the development path is important to ensure that all factors are considered.

An EBDP provider could encourage dialogue. This dialogue will be facilitated through the length of time the relationship has been established. The case studies have shown that trust is developed over time. Learning and development dialogues encourage a possible shift in the personal constructs of the owner managers. If the owner manager has the “spark” of an idea then the EBDP provider could create an arena where ideas and concepts can be discussed openly.

The cyclical nature of PAR used within the EBDP allow for ideas to be expressed that may not develop. Using PAR all parties are equal so ideas can be expressed freely. Most important is the notion that the owner manager can through an idea or concept trigger a change in their personal constructs. This may have a direct bearing on the firm now or at a future date. If the new idea does not develop it still has benefits through a deepening of the relationship between the owner manager and the EBDP provider.

8.3. Reinforcing and extending current literature-based insight

Within this section key areas of insight revealed within the study are considered in terms of how that insight reinforces or extends understanding as embedded within the literature.

8.3.1. Participatory Action Research and Personal Construct Theory

The methodology used in this work is an adaptation of the work of Archer (1988) and Wyer (1990).

It utilizes the Personal Construct Theory of Kelly (1955) to identify through any shift in owner manager personal constructs positive or negative attitudes to e-business adoption in small firms. The researcher via the PAR process worked with the owner managers *during* the research.

Previous studies have used Participatory Action Research in the field of managerial research. Shankar (2001) felt that the cycles of PAR were important. The work did not simply have a beginning and end that began with a hypothesis and proceeded with an investigation. All parties examined and evolved the research together. The cyclical nature of PAR is considered important and this standpoint is also supported in these studies. In Case Studies 3 and 5 the ongoing development of e-business was not a singular event. In the case studies significant critical incidents as defined by Chell (1998) did occur and these events were the springboard for new ongoing developments. However, to cease the studies after any critical incidents would have hindered the PAR process and thus not have revealed the depth and breadth of insight achieved in the ongoing processual development of the studies as conducted in this research. The research was undertaken by the researcher and the owner manager working together. The shifting of the personal constructs of the owner managers was important in e-business development. This enabled the work to reveal insights that would not otherwise have been possible. These are within the arena of relationship strategies, working practices and strategic development.

One key to nurturing e-business adoption in the studies was the researcher

identifying shifts in the personal constructs of the owner managers. This was achieved through the use of a PCT (Personal Construct Theory) framework. Some of the personal constructs of the owner manager were resistant to change and e-business development was much harder. Discussion of these results with the research team and the owner manager assisted in e-business adoption.

Importantly the cyclical nature of PAR allows for the development of the studies during the research process. If any issues are highlighted then these can be tackled within the research process and framework.

8.3.2. The E-business Development Platform (EBDP)

The utilisation and deployment of the EBDP in this work engages in Tapscott's (1996) concepts of disintermediation and virtualisation recommended by Tse and Soufani (2003) as applicable to the small firm. These concepts were then deployed within the case studies at various Internet States. The EBDP was used to successfully facilitate Internet States 2 and 3 within the studies. Case Study 3 did evolve to Internet State 4 but chose to do this via a commercial supplier. It is technically possible that the EBDP could have provided this level of e-business. However particular variances within the study and the time constraints of the researcher and the study meant this was not practical.

Stone (2004) warns of the cultural shift that may have to occur to achieve the more complex higher Internet States. This work reveals that this is not just based within the firm but when a firm engages with an e-business provider using the EBDP. The use of EBDP in this work begins at Stone's Internet State 2 (publish). Even at this early stage of e-business some processes are shifted from within the traditional boundaries of the small firm and are managed by the EBDP. Evolving to more complex Internet States via the EBDP shifts more processing to the EBDP and less functions are managed within the firm. This breakdown of the traditional boundaries of a firm predicted by Tapscott (1996), ensure that a firm can manage and engage in e-business.

Thus the utilization of an EBDP can be challenging to a firm due to a shift in business processing. Elements that were previously managed within the boundaries

of the firm such as sales and marketing may now be managed by the EBDP. This initially created a resistance in the owner managers and the firm to evolve into more complex Internet States.

8.3.3. Trusted agents status

In the case studies that developed beyond the initial contact stage, a key element of successful e-business evolution was the researcher acting as a trusted agent. This was important for two reasons. Firstly the researcher positioned the EBDP as part of the firm's extended enterprise. Doing this allowed for the shift of business processing to be more easily accepted by the firms and owner managers. This position overcomes some of the hurdles to adoption that were highlighted by Currie (2003). Currie suggested that the impersonal nature of Application Service Providers interface with small firms may have been a contributing factor to their failure in the early 1990s.

The trusted agent's posture by the researcher also enabled a deeper use of Participatory Action Research (PAR). The use of PAR brings the case study owner manager within the EBDP through "action learning". Partnership working where no party or individual is the leader allowed for the owner manager to engage with the researcher as an equal. This is an important element and allowed the researcher to be integral to e-business development within the studies.

The results of the studies show that if the posture of a trusted agent is adopted by the researcher using an EBDP this can have a positive impact on e-business development. The relationship engenders trust, which allows an owner manager to be more open to the possibilities that e-business can facilitate. Therefore one key element of being a trusted agent is the relationship strategy used by the EBDP provider.

In three of the case studies where this occurred it led onto phase 2 development. This phase involved using e-business provision in ways that were not part of the firm's original working or business practices. In Case Studies 1 and 2 a contributing factor to the termination of the studies was the lack of a trusted agent's status within the firm's extended enterprise.

In the first two studies the researcher encountered fixed perceptions and rigid world views of the firm's owner managers. Case Study 2 also had ethical issues. The researcher was not able to bypass these hurdles. However, when the researcher and the research team evolved the EBDP with the use of a trusted agent's status, e-business development improved in the case studies that followed.

8.3.4. The owner manager and the small firm competency and skills gap

A key existing literature-based insight informing this study was the raising of awareness within the researcher of the control the owner manager has within the small firm (Brown 1971). It is this high degree of control that can have a bearing on e-business development. The use of PAR and the adoption of trusted agent's position in the extended enterprise compensated on a case by case basis for the unique elements of the owner manager in each firm. Thus the unique environmental influences and challenges faced by each firm were understood from the perspective of the firm's owner managers.

The use of PAR and the underlying bootstrapping methodology bolstered by the literature (Welsh and White, 1984; Curran; 1988; Wyer 1990, 2004; Gibb throughout the 1980s and 1990s Fillis and Wagner, 2005) facilitated the researchers understanding of the uniqueness of the small firm. The provision of the ICT infrastructure alone was not enough to evolve the firms into more complex e-business. Other elements of the platform need to work in unison with the architecture to engage in e-business. Coupled with the ICT architecture of the EBDP additional ICT skills are needed. These comprise of the software and configuration skills needed to deploy the EBDP in line with the strategies and development plans of the firms. These were provided by the researcher and overcome the ICT competency and skills gap (Smyth and Ibbotson, 2002; Quayle, 2002; DTI 2003; DTI 2004, Dixon et al. 2002). The EBDP also overcomes the lack of resources within the case studies and often found in small firms (Thong 2001).

8.3.5. Small firms and co-evolution

The notion of co-evolution (Holland 1995; Kauffman, 1995; Johannison et al., 1994 and McKelvey 1999) was also important to the owner managers of the case studies. Often within this work the firms evolved their e-business according to the environment they exist in. In Case Study 3 this can be seen by the development of e-commerce at Internet State 3 and the consolidation of the firm's internal activities at Internet State 4. Discussions with the owner manager revealed that he saw others within his industry implementing these processes and felt that not to do this would leave the firm behind. In Case Study 5 the owner manager of the architects' practice enabled a paperless office which was a result of the developments of the government initiative to introduce on line planning applications. Both of these developments were a reaction to the environment they exist in.

8.3.6. EBDP security

The EBDP also provides the technological infrastructure to ensure that e-business is managed securely. The ICT infrastructure of the EBDP is capable of interacting with payment gateways and other ICT systems which enable the development of more complex e-business provision.

An important element of the EBDP is the notion that ICT security is not "static". ICT security needs are constantly changing and evolving. EURIM and its publication of an advisory security policy documents do not address the needs of a small firm in e-business transition. The use of the EBDP addresses these needs within a small firm on an individual basis. This allows for the unique elements of each firm to be compensated for. It allows for legacy ICT systems and examines security needs based on the location of services provided. This creates a road map for evolution with an understanding of the security concerns and fears of small firm owner managers (Fillis and Wagner, 2006). It is the PAR elements of the EBDP that are used to inform the owner manager and engage them in dialogue which allows the issues of ICT security to be managed within the capabilities of the firm. This can be modified as the firm evolves to compensate for new learning by the owner manager or the adoption of new e-business provision.

8.3.7. EBDP and the strategic development process

In this work, the strategic development processes and resulting paths were an emergent element of the facilitation of PAR via the EBDP. No firm within the study had a clearly defined development path at the outset of the work. The exposure to e-business provision enabled owner managers to examine and “try on for size” elements of e-business that they felt may be of use. When and if they found e-business successful they would then examine e-business in the light of these developments and how they could further use e-business within the firm. Thus the strategic development process emerged during e-business evolution. This in turn had an impact upon their relationship strategies with other key actors. This emerging strategic dimension was assisted by the researcher and the owner manager engaging in learning and development dialogues.

Importantly each firm in the study was offered the EBDP and each firm chose to adopt e-business in different ways. Some firms used it to increase market reach and penetration others developed their relationship strategies as a primary focus. This demonstrates that the deployment of an EBDP was and can be tailored to suit the varying needs of the strategic development aims of small firms.

8.3.8. Small business strategic management and strategy formation

The literature review which informed this research highlighted a high level disparity with regard to the ways that business organizations do or should approach the activities of strategy formation and strategic management. Mintzberg et al. (1998), for example, identified and critiqued no less than ten differing schools of strategic management thought. Moreover, much of the knowledge base embedded within those schools of strategic management thought tends to be large company oriented and does not accommodate the distinctive managerial, organizational or developmental features of small business (Wyer, 2003; Carson, 2000). Key findings in this research suggest that the premises and prescriptions within the rational long term planning model of strategic management and its proffering of tidy step management processes which can reveal predetermined strategic development paths are likely to have limited application for the small business. Owner managers within this study are more oriented toward propositions embedded within the learning

school of strategic management thought. Key small business issues relating to the uncertainty of the external operating environment, owner manager confidence and ability levels (including with regard to existing levels of owner manager understanding of ICT and technological change) and resource and time constraints all interact. This emphasises the likelihood of successful small business owner managers having to 'learn their business along'. And thus how 'emergent' strategy development, as opposed to pre-planned or pre-determined long-term development path, is likely to facilitate small business development.

Moreover, the use of Personal Construct Theory within this study draws attention to the role of, and need to understand, owner manager mental processes. Focusing on their efforts to determine the potential application of ICT in their businesses helps determine how ICT may facilitate and/or trigger new strategy development. Thus small business strategy formation is likely to be intertwined with owner manager willingness and ability to reflect on, challenge and adjust existing inadequate personal constructs relating to parts of their business and/or of ICT.

Key strategic management findings within this study, therefore, highlight how small business strategy formation and strategic management is likely to be better understood from a multi-perspective approach. The underlying aim of this research does not just have a strategic management focus. However it does consider how ICT impacts upon the strategy development context of small businesses. Case study insight reveals how effective small business strategy formation has a predominant emergent (learning school) dimension. Much of the strategy development takes place within the mind of the owner manager as mental process (cognitive school), rather than being committed to paper and written planning. Some small business owner managers (such as in Case Study five) are more entrepreneurial and able to capture the future longer term direction in a mentally held vision (entrepreneurial school of thought).

Recognising these different dimensions of small business strategy formation is important. How small businesses do or could strategically manage their business and attempt to effectively deal with their highly uncertain environment has key implications for those attempting to aid small business development and growth. Not least in the area of ICT support provision for progressive small firms. A key

area is an understanding of the various dimensions and associated learning and management activities that contribute to small business strategy development. This provides a guiding development frame for approaching effective use of ICT in support of those strategy development activities. This is in terms of direct support of those effective management processes as now practiced, or in terms of determining the potential of ICT to modify or replace those processes with more effective owner manager management practices. The important message is that a single as opposed to multiple perspectives of small business strategy development and strategic management will severely constrain the creative use of ICT in growth seeking small firms.

8.3.9. The potential contribution of Personal Construct Theory in facilitating small business ICT uptake

When Kelly (1955) designed and developed Personal Construct Theory he proceeded upon a base premise that we as individuals are kind of scientists who make sense of our world by building a personal theory or (personal constructs) of it. Kelly highlights that an individual builds these personal theories or constructs from the experiences he encounters in life. When formulated in the individual's mind the personal construct forms the basis of his or her subsequent actions and anticipations (Harri-Augstein et al. 1995). In short, an individual uses his existing personal constructs as frames of reference to tell him what form of behaviour to undertake when faced with a set of circumstances or change situation. As a 'scientist' looks to test out, through his actions, if the behaviour is appropriate, his personal constructs help him to predict that behaviour "X" will bring about anticipated outcome "Y". If the outcome is as anticipated his personal constructs are valid. If the outcome is not as anticipated, he must challenge and change his personal constructs.

Utilising PCT within this study supports this base 'man the scientist' proposition. This study demonstrates how the participant case study owner managers used their existing personal constructions with regard to their perceptions and levels of understanding of what ICT does or may entail for their business. Integral to this an owner manager should foster a progressive understanding of ICT and its potential.

Often he must participate in a learning and development process which sometimes merely requires a nurturing of his existing personal constructs through nudging up his current understanding. However it sometimes involves a complex and uncomfortable challenging of his existing inadequate personal constructs.

In effect, the PAR based approach to this study and its integral EBDP replaces the traditional formal business transaction interface of ICT provider to the small business. In its place offers a small business 'ICT learning and development environment'.

Firstly, rigid, hazy or fear stricken owner manager personal constructs surrounding cost and initial ICT capabilities are eased by adoption of a 'partnership working' approach. This identifies and provides an appropriate base ICT infrastructure. Secondly an ongoing PAR researcher assessment and implementation processes progressively facilitates incremental enhancement of owner manager personal constructs. This reveals the potential of ICT and its various applications. This allows for effective sustainable strategic development of the business and day to day working practices that underpin that development.

Crucially, embedded therein is a two dimensional experience based owner manager learning and development path. This enables the owner manager to reinforce areas of adequate ICT understanding within his existing personal constructs, or to adjust or replace those personal constructs which are inadequate. Experience learning dimension one relates to the actual assessment and implementation processes with regard to the areas of ICT provided by the PAR researcher through partnership working with the owner manager. The PAR researcher works with the owner manager to assess his business needs, and identify appropriate facilitating ICT and introduce it in working form into the small business context. Owner manager challenging and extending of existing personal constructs is thus impacted through learning and development processes by the PAR researcher careful explanations, learning and development dialogues. This is coupled with associate participation in actual practical experience relating to assessment and ICT implementation. Paralleling and often intertwined with this 'actual practical experience' learning dimension is a second indirect 'bringing forward owner manager experience' learning dimension. Such 'bringing forward of experience' sees the PAR researcher

offering key informant learning inputs for the owner manager. The latter is able to learn from the trusted agent expert PAR researcher. Gradually through learning and development dialogues not related to actual practical experience, the owner manager begins to leave the comfort of existing constraining personal constructs by 'trying on for size' the ICT expertise and personal constructs of the PAR researcher. In this latter dimension of learning, the owner manager is in effect learning from the experience of others (the PAR researcher) without investing in time, costs, practical activity and from mistakes from actually experiencing that practical activity.

Reflection on the nature and form of owner manager ICT oriented learning and development within the all the case studies in this work explains, at least in part, why traditional and more distant ICT support provision can encounter difficulties. Close and ongoing 'partnership working' between small business owner managers and ICT providers, underpinned by a trusted agent status, is more likely to facilitate effective owner manager learning and development processes. This is more likely to facilitate the requisite reinforcement of and adjustment too existing personal constructs; or replacement of inadequate constructs.

There is, moreover, a strong case for utilising understanding of the nature and form of owner manager personal learning and development processes. This can be used as the underlying focal vehicle in approach to assessment of small business ICT development needs and the associate interface between owner manager and ICT support provider. This in the place of an out and out, upfront 'available information technology'- 'small business development needs'- 'identified appropriate ICT applications'- 'implementation' content/ process route. ICT provider willingness and ability to determine existing levels of owner manager ICT understanding, receptiveness, fears and aversions as embedded within owner manager existing personal constructs and willingness and ability to enhance those personal constructs have been shown to be key in this study. Of course, the PAR researcher conducting this study is not a psychologist and has only used Personal Construct Theory as an approximation of the ways that owner managers learn and develop. It may be that in small business ICT support provision practice that some other conceptualisation of how we as individuals learn or some other learning theory can more effectively take the place of PCT. At issue is the potential for ICT providers to adopt as a starting

point and ongoing development foundation a support focus which concentrates significantly upon building understanding of the owner manager's existing levels of understanding and perceptions as to ICT and its capability for his business. Importantly, how that understanding can be progressively enhanced and nurtured along a learning and development process. This contrasts enormously with quick in-out commercially oriented small business ICT support provision. It is more likely to see an EBDP provider as a facilitator of owner manager and organizational learning and development. This ultimately sees an EBDP provider as an embedded part of the strategic development of the small business.

9. Conclusions

9.1. Introduction

This study has focussed upon e-business evolution within small and micro firms and its impact on strategic development, working practices and relationship strategies. It has proceeded upon the premise that small businesses are qualitatively different from large companies in that they are resource and time constrained and display distinct managerial and organizational features. Indeed, many small businesses adopt relatively informal and idiosyncratic management processes. Such distinctiveness has thus prompted design and development of an innovative research methodology which can capture small business idiosyncrasies and reveal and address key enabling and constraining features which may impact or assist small business uptake and usage of ICT, and the study of such uptake and usage activities and processes.

This final chapter summarises key findings of the study and the innovative research methodology that produced those findings. It then gives consideration to further potential avenues of research that could build out of this work and how future research approaches may be enhanced. The chapter concludes by considering the practical implications of this work for small business ICT providers.

9.2. Summary of key findings and conclusions

This section summarises key findings and conclusions of the study by objectives. Key findings are highlighted and implications elaborated.

9.2.1. Summary findings relating to research objective one:

Research objective one of this study oriented the investigation toward consideration of the extent to which, and how, providing a small firm with ICT provision capable of e-business functionality impacts on the strategic development context of the participant firms.

The following provides summary key findings relating to this research objective:

- a) As expected, all participant case study owner managers at the commencement of the research viewed the potential of e-business applications for their business within the confines of their existing personal constructs of ICT, and their personal constructs had been formed by the nature and form of owner manager experience of ICT to date. Without exception, the owner managers initially predominantly perceived e-business technologies in terms of a means for their small business to extend market reach. This is at Internet State 2 (publish).
- b) As owner manager's personal constructs and understanding evolved over time to more advanced Internet States of 3 or 4, the owner manager's awareness grew to recognize e-business potential for achieving enhanced consolidation of the existing strategic position of their business and/or increased market penetration or market development.
- c) The PAR process and the integral key trusted agent role of the PAR researcher was the major facilitator in enhancing and nurturing on existing limited owner manager personal constructs of ICT and its potential for the case study businesses. Of particular significance was the role of the PAR researcher in offering careful explanations and suggestions with regard to e-business potential for a case firm and early action involvement of the owner manager in design, development and implementation of e-business applications.
- d) Such a participatory action research approach facilitated extension or replacement of owner manager existing personal constructions of ICT and its small business development potential from two dimensions: firstly, owner manager action involvement provided personal learning and development from first hand experience of ICT; and secondly, through learning and development dialogues which allowed the owner manager to 'bring forward his experience' of ICT by 'trying on for size' the worldviews, understanding and perspectives of the PAR researcher (rather than having to wait for future actual experience).
- e) There is clear evidence in the study showing that how ICT was used within the case firms' strategic development processes was related to the owner manager perceptions of e-business at varying Internet States. In short, as owner manager understanding of the potential surrounding the different Internet States shifted and

absorbed that potential and a more complex Internet State of activity was adopted, e-business became part of the strategic learning and strategic development processes of the firm at the Internet State positively perceived by the owner manager. In situations where the case study firms' owner manager failed to enhance his perception of e-business potential with regard to a more complex Internet State, the strategic development processes and activities remained at the Internet State he was currently operating at.

- f) With regard to clear strategic development context benefits of small business uptake of e-business technology, it is the combination of the nature of e-business applications adopted by the participant case study firms and the manner in which those applications were anchored in to the firm which results in those strategic development benefits. For example, for the more dynamic owner managers the uptake of e-business applications has resulted from a gradual unfreezing and opening up of their personal constructs in a manner summarized above which sees progressive recognition of what e-business can do for their business becoming embedded in their strategic thinking and thus providing underpinnings for strategic development opportunity recognition. One key example of this is the small business growing ability to obtain timely, quality information from enhanced communication and dialogue with key actors and stakeholders on the boundaries of the firm's activities. And to work up the raw external environment derived information to effect 'learning up' of this base insight to effect internal business development actions that facilitate strategic growth through, say, consolidation or market penetration. Moreover, a key integral dimension here is how owner manager engagement and involvement in the e-business design and implementation processes bolstered owner manager confidence building and understanding of the real potential of the e-business application for his business. This constitutes an owner manager 'educating process' resulting in an enhancement of the owner manager's ability to identify and work through the significance of potential future strategic development opportunities. Either from the direct using of the existing e-business application in his strategic and operational management; or from his enhanced strategic thinking and learning orientation toward what further e-business applications might offer his business.

- g) Embedded within the above and deserving further attention is the issue of owner manager strategic learning capability. In all of the participant case studies owner managers demonstrated elements of frozen attitudes, fear of the unknown, lack of understanding and resistance to change. Much of this constraining context supports current literature based evidence with regard to restrictions on small business uptake of ICT, including cost, technology adversity and lack of understanding of ICT potential and what implementation will involve. Within this study, however, an 'educated layman' use of the guiding premises embedded within Personal Construct Theory alerted the researcher to the likelihood of existing personal construct based obstacles and constraints to the owner manager taking on board the potential of ICT for his business. And of the need to try to determine a 'starting point' of understanding of owner manager perspectives, views and reservations in this regard. Understanding and use of a PCT based learning process, and out of this the dual PAR provision of experience based ICT learning provision (through 'partnership working' on e-business application assessment, design and implementation) and trusted agent PAR researcher status in the facilitating of owner manager learning and development dialogues, effectively nurtured owner manager reflection on and enhancement of existing inadequate personal constructs. In so doing enhanced owner manager strategic understanding of e-business and its potential; and owner manager strategic learning capability.
- h) Key e-business derived strategic development context benefits summarized above thus include: enhanced ability to interface with and learn from key actors within the firm's external environment; improved quality and timeliness of strategic information; enhanced owner manager strategic thinking, strategic awareness and strategic learning capabilities. Such benefits can be predominantly portrayed in terms of enablers and facilitators of enhancement of existing core strategic activity of the participant case firms and/or pursuing of new paths of strategic development. However, juxtaposed to the e-business enhancement and facilitating inputs to the participant case businesses are the business strategic development outputs that they facilitate and enhance. These include rebranding and reputation or kudos building of the firm through professional website design and development (and associate owner manager feelings of 'ownership' of the

application through his partnership working involvement). And associate reinforcement of existing strategic position, increased market penetration and/or new market niche development. Examples of this are owner manager confidence building and professional status building of the firm (following the e-business design and implementation process) which the owner manager perceives to be at least on a par with its parallel large company competitors. For another case study, e-business facilitated company restructuring and sharing and management of data and information at disparate locations. For each of the more progressive case study firms, new knowledge of e-business provided feed in to strategic and operational decision making processes. This often created a springboard for searching and/or pursuing further strategic development paths.

- i) In the successfully progressing case firms, it is owner manager early stage experience of ICT implementation, in its confidence building that helped in opening up owner manager limited personal constructs of ICT. This nurtured the owner manager toward seeing the potential of e-business to take his business down new strategic development paths. But such ICT experience and familiarizing activity is not alone sufficient to drive the owner manager on to effectively follow new business development paths through further e-business application. The progressive owner manager within this research who moves toward seeing optimum potential of e-business for his firm also has drive, determination and depth of understanding of his business and its target marketplace. A key characteristic of the 'limited e-business adoption' owner manager within this research shows him to be short in understanding about new market niches he is attempting to serve and of the customer and the customer needs he is hoping to serve. Together with an unwillingness and/or lack of ability to derive that required understanding. In this latter example, a potential strategic development strand of business activity which was revealed to the owner manager through his growing knowledge of the existence of a particular e-business application was not successfully implemented because of his lack of drive and business knowledge.
- j) Finally, PAR based interaction with the participant case studies in this research provided insight into the nature and form of small business strategy development

processes. Whilst this study has not predominantly set out to solely understand small business strategy formation, it has revealed that none of the case firm owner managers follow a formal, tidy step process form of rational long-term planning mode of strategic management. Rather, newly identified strategic development paths have tended to be more emergent in nature. These frequently result from the ongoing strategic learning activities of the owner managers in their interactions with key actors on the boundaries of the firm's activities. Small business lack of resources, time and abilities appear to combine with operating in a highly uncertain external environment to limit potential for use of formal rational long term planning types of management. It also appears, therefore, that uptake of e-business applications may, through careful attention to design and implementation be adapted to assist in owner manager strategic learning and small organizational learning based forms of strategic management.

9.2.2. Summary findings relating to research objective two:

Research objective two of the study oriented the investigation toward consideration of the extent to which, and how, providing a small firm with ICT provision capable of e-business functionality impacts on the working practices of the participant firms.

The following provides summary key findings relating to this research objective:

- a) Focus upon the cross section of case studies within this research has demonstrated how careful 'partnership working' (ICT support provider-owner manager) introduction of e-business has facilitated clear improvements in small business working practices. These range from the build up and cementing of learning and working relationships with customers and suppliers to enhanced administration processes, reporting procedures and financial management practices.
- b) A key facilitating ICT tool for this research was a Content Management System (CMS). This was central with regard to day-to-day working practices within the case firms and a key element in adoption of e-business.

- c) More progressive case study firms within the research utilized a CMS to bolster their relationship strategies with key actors on the boundaries of the firm's activities and to increase market reach and market penetration.
- d) During CMS configuration, all participant case firms found use and management of the system difficult. One can conclude that it is likely many small businesses will find the tasks of learning to manage and configure a CMS to be a constraint to its adoption.
- e) The role of the EBDP provider and integral role of trusted agent status was a key facilitator in addressing difficulties in CMS implementation and usage. In particular, the EBDP provider owner manager relationship fostered owner manager openness and honesty with regard to skills and ability levels throughout the organization.
- f) The research demonstrated that development and provision of operations' manuals for the case firms was on its own an inadequate approach to fostering of requisite ICT learning and training, and development of requisite working practices. Instead, the EBDP provider trusted agent role facilitated the undertaking of an informal skills and resources audit. This provided a base understanding of organizational and individual skill and abilities' deficiencies and understanding of any resource gaps. This in turn provided a solid foundation for building forward toward effective e-business implementation, usage and management.
- g) Further issues constraining e-business development within the case firms related to ownership of and access to data. Small business owner manager's perception of location of data beyond the confines of their business based personal computers and onto a remote server can prove to be a development hurdle. The EBDP breaks down the traditional boundaries of the firm and again it is the trusted agent status of the provider, through the build up of trust, which overcomes development hurdles.
- h) Effective configuration of a CMS and quality content requires solid owner manager understanding of his business, its strategic development aims and what

he wants the application to say and to whom. Without this working context of understanding, effective quality content development is severely constrained.

- i) The issue of need for full context understanding of the particular small business when approaching ICT needs assessment and implementation was exemplified in the case study investigation. In one instance, inadequate owner manager understanding of an e-business application and its potential impact on working practices, processes and individual workers which it would embrace resulted in much less than optimal returns from initial deployment. In fact it created a resistance from and unease in some staff members whose roles and inputs had been overlooked and ignored.
- j) At issue is the need for an owner manager to constantly perceive and consider his business holistically. This approach incorporates (where possible) the external development context and the nature and form of interdependent business activities which constitute the internal business context. These contexts need to be incorporated into assessment of the appropriateness and form of e-business applications under consideration.
- k) Such a holistic perspective sees build up and sharing of 'big picture' understanding between owner manager and e-business support provider. This assists with identifying the implications of any new required working practices deriving from the e-business implementation. Importantly, this holistic perspective incorporates the potential knock on effects to other working practices throughout the business.
- l) The PAR research process and integral trusted agent status of the PAR researcher/ICT provider draws specific attention to the beneficial role of 'partnership working' between owner manager and support provider. The underpinning use of Personal Construct Theory within the research approach highlights not only the potential limiting nature of owner manager personal constructs of e-business and its possible utility for his business, but also the possibility of limited owner manager perspective and understanding of the actual matching of the e-business to the operational and strategic development activities of the firm and integral working practices. The 'partnership working' approach of

PAR demonstrates how the ICT provider can gradually foster and enhance owner manager personal constructs and understanding in this respect.

- m) Moreover, the selective focusing (on certain business activities or issues but not others) or limited perspectives which may be embedded within the owner manager's personal constructs are not confined to the owner manager. It is both the owner manager and ICT provider who are bringing limited perspective and selective focus to the small business table, each likely to be focusing upon what they understand and feel comfortable with. It is 'partnership working' which can facilitate an exchange of standpoints, interchange of ideas and synthesis of perspectives and result in the build up of 'big picture' of understanding of the small business development potential and needs. This will foster a joint understanding of e-business application potential and implications, including in terms of required working practices and existing working practices' adjustments.
- n) Given the essentially unpredictable and unknowable nature of the external environment in which small businesses operate 'partnership working' building up of understanding and development of perspectives is extended to progressively capture insight into the nature and form of the external environment. This may indentify change forces and factors which may have implications with regard to what are appropriate forms of e-business application. Importantly in attempting to compensate for the enabling and constraining operating context which the e-business is to be designed and developed to serve.
- o) Finally, the holistic perspective approach encompasses consideration of more sensitive internal development context. This allows for issues that surround the internal anchoring in of e-business applications to be considered at an early stage. These include effective development and implementation of associated working practices. Within the case study investigations in this research, crucial issues arise relating to organizational and management approaches which can get the best out of the business in its totality and key individual staff. Issues of organizational culture in terms of 'the way we do things round here', the knowledge base and understanding embedded in individual workers, and (as discussed above) the knock on effects from change in one set of working practices to others are ignored at the owner manager's peril. The holistic

approach to build up of full context understanding can facilitate, and indeed underpin, the anchoring in of key organizational understanding and development ideas of key staff with regard to uptake of specific e-business applications. Not only is this likely to foster staff 'ownership' of any ICT and associate working practices changes, it also provides context for addressing any ability and resource deficiencies and determination of training and development needs.

9.2.3. Summary findings relating to research objective three

Research objective three of this study focused on determining the ICT security implications of empowering a small and micro firm whilst undergoing ICT development.

The following provides summary key findings relating to this research objective:

- a) ICT security is a constantly moving platform. New security threats are often raised and this is a cause for concern to small businesses. This work has shown that the participant small businesses do not have the skills or resources to manage ICT security effectively. It is likely that such skills and resources shortfall epitomise many small firms.
- b) Concerns about ICT security will in many small businesses, therefore, stall, or at least hinder, e-business development. ICT technologies develop rapidly, and change is frequent. This is coupled with the increasing ability and propensity of criminally minded individuals to infiltrate or corrupt business and personal computer systems. Thus the issue of ICT security is a growing concern for small businesses and an increasing challenge to those tasked with addressing such difficulties.
- c) Within this work, the nature of the PAR process with the researcher acting as a trusted agent allowed for owner manager concerns about security to be addressed in light of current and new developments. Engaging with the researcher as a trusted agent eased owner manager fears and concerns and

facilitated the triggering of owner manager ideas relating to e-business development.

- d) Importantly, this study included focus on the normal ICT considerations that are traditionally known as ICT security practices, such as virus threats, polices etc. It also addressed the security needs and concerns of firms who wished to evolve their ICT provision to facilitate new forms of e-business. Such development involved change in ICT deployment and related working practices. This highlighted how managing ICT security within growth seeking small businesses needs an approach which addresses the 'big picture' of the small business. It needs to incorporate the firm's development aims and requirements and give consideration to potential breaches of ICT security within this big picture context.
- e) Focusing within this study on this 'big picture of small business development' allowed for identification of intended or potential transitional phases of the case study firm's ICT development. Often in this work the case studies 'tried on for size' new ideas before deciding to fully commit and thus went through an 'ICT transitional phase' from one form of e-business to another. And it is in a transitional phase that ICT systems are at their most vulnerable.
- f) Within this study the issue of 'transitional phase systems vulnerability' was overcome by the EBDP providing an overarching security policy and ICT system that enabled the migration and development of e-business to occur safely and securely.
- g) A key element of the Participatory Action Research process was the identification of potential for small business development and growth through progressive use of the different Internet States of e-business development. Once a new Internet State was achieved the researcher worked closely with the owner manager to 'hand back' security issues to the firm that could be managed by them. This left the EBDP to manage the technical elements of ICT security that were beyond the capabilities of the firm.

- h) The EBDP based security management approach which underpinned the study was only achievable by the researcher and the owner manager fostering a long term working partnership utilising PAR.

9.2.4. Summary findings relating to research objective four

Research objective four of the study examines the extent to which, and how, providing a small firm with ICT provision capable of e-business functionality impacts on the relationship strategies of the participant firms.

This subsection summarises key findings relating to this research objective:

- a) The researcher's relationship strategy within this study was based upon his position of a trusted agent to the owner managers and was a key element in the successful deployment of e-business.
- b) When this relationship was hampered, as in Case Study 1 by the researcher being viewed as in the customer supply chain or in Case Study 2 by ethical issues, then e-business development did not occur. In the later case studies partnership working via PAR ensured e-business development that was understood and adopted by the firms
- c) Thus a key conclusion of this work is the need to foster integrated perspectives involving enhanced understanding from the joint standpoints of the EBDP provider and from that of the owner manager. From an interpretative stance of Personal Construct Theory, it is necessary for the ICT support provider and the owner manager to adequately 'get inside each others personal constructs', 'try them on for size' and empathise with each other. The extent of difference of perspectives of PAR researcher and owner manager which arose in Case Study 1 and extent of commonality of perspective between PAR researcher and the more progressive case study owner managers pushes home the importance of this issue.
- d) From the standpoint of external ICT provision, truly effective application of e-business at differing Internet States will not be achieved within small firms unless the distinctive problem, opportunity and development contexts of

small businesses are better understood. This study highlights the distinctiveness of small businesses vis-à-vis large companies, how they are qualitatively as well as quantitatively different from large companies, and how understanding of such distinctiveness is key in approaching assessment of ICT development needs and implementation forms.

- e) From the standpoint of the owner manager, real application effectiveness will, especially at the strategic level, be enhanced through progressive build up of understanding of his or her business, its interrelated parts and the enabling and constraining external context in which it operates. Integral to this is the issue of how successfully developing small firms actually learn in a strategic development context. This work has demonstrated that the relationship strategy of the researcher via PAR and a trusted agent's status can help facilitate this understanding.
- f) This work has also shown that some forms of e-business development are dependant upon the firm's relationships with other actors and stakeholders. This began with the design of the new ICT systems which were considered to be important by the firm's owner managers. The owner managers used design as a means of raising the external profile of the firm. Therefore they used e-business to develop and enhance their relationship strategies. From this starting point they then began to examine other areas of e-business and in many cases aligned new e-business processes with their relationship strategies.
- g) When the participant firms migrated through the Internet States the new armoury of e-business tools made more information available. This was seen by the owner managers as a rich source of information that could be used to deepen their relationships both inside and the boundaries outside of the firm.
- h) The case study firms' 'real world' relationships and e-business relationships were intrinsically intertwined in this work. Case Study Four has a poor set of relationships and e-business was difficult to develop using hubs. In Case Study Five, the owner manager felt unsure about how his relationships would be impacted upon by deploying e-business in phase 2 and development

stalled. Both of these studies were impacted upon by the firm's 'real world' relationships.

- i) It is a conclusion of this work that deploying e-business has an impact upon the firm's relationships inside and outside of the firm. This needs to be understood by the owner managers and facilitated with guiding insight by the EBDP provider acting as a trusted agent. This will ensure that e-business is more effectively utilized, as adoption of e-business may be hampered by a lack of consideration towards the relationship strategies needed by a small firm at differing Internet States.

9.2.5. Summary findings relating to innovative research methodology underpinning the study

- a) The approach to fulfilment of the aims and objectives of this research was founded upon the design and development of an innovative action research methodology which could address weaknesses associated with more traditional modes of small business research. Design and implementation of this methodology has allowed for a research investigation which supports the proposition that there is a tight relationship between content of understanding and method for understanding.
- b) Having identified the potential of utilising PAR as an appropriate action research approach for the study, early assessment of PAR as a research tool demonstrated that potential weaknesses also exist if unqualified application of this mode of study is adopted. The key potential weakness is the lack of rigorous epistemological base upon which to found a PAR approach.
- c) In order to address this weakness, a creative base dimension of research process was undertaken. This took the form of an epistemological bootstrapping process. This involved a literature review extended to field review whereby key areas of relevant literature, initial world of small business practice insight and key strands of the researcher's experience were synthesised. This created partial frames of

guiding insight and integrated into a conceptual framework to foothold approach to research design and empirical component of study.

- d) The epistemological bootstrapping process provided the requisite epistemological foundation rigour to the PAR process. It embraced a multi-disciplinary approach through its capture of foundation perspectives from ICT, small business, and strategic management literature-based knowledge bases.
- e) The research in its totality was founded upon compatible philosophical foundations of non-positivism/internal realism. This captured the inter-subjective nature of the empirical research process. This enabled the presentation of new knowledge and understanding in a form which sees knowledge developing from facts and value, with an underlying acceptance that facts and value are intertwined.
- f) The all embracing PAR research approach allowed for a research study that involved all relevant parties, owner manager and ICT support provider. They actively examined together current small business activity and potential ICT implementation in order to change and improve that current business activity.
- g) The PAR approach was also oriented to incorporate a case study mode of descriptive analysis of each participating action research case study business. In particular, the recording and presentation of the e-business uptake in the participant small firms in full small business context. This allowed for embedding understanding of knowledge developed in this research within the context through which it has unfolded.
- h) Cost, time and ability constraints are major hurdles to small business uptake of ICT and thus key hurdles to effective study of small business ICT uptake and usage. A further innovative dimension of this research has been the design and provision of 'facilitating ICT research tools' which have circumvented traditional constraints to small business ICT uptake. These tools have contributed to the development of a kind of 'research laboratory' which has facilitated this small business ICT study.

- i) A key dimension of this facilitating tools approach has been the design and development of an E-business Development Platform (EBDP). The use and deployment of the EBDP challenges the traditional boundaries of a firm. This initially presented problems in this study.
- j) This challenging element of the EBDP draws attention to how the use of the qualitative methodology within this study is a crafting process. The researcher has crafted the research process to accommodate both hurdles and enabling dimensions of the study as he has progressed along the PAR process.
- k) The EBDP issue serves as an example. Owner manager concerns about control and management of ICT services were overcome by moving the EBDP into the firm's extended enterprise. An important element in achieving this was the relationship strategy utilized by the researcher. This was facilitated by having the posture and position of a trusted agent within the firm. It was the trusted agent's status that enabled the firms to more fully accept the shift in the location of services to the EBDP within the firm's extended enterprise.
- l) An integral part of the crafting process within the methodology was thus the combination of moving the EBDP to the firm's extended enterprise and the adoption of the trusted agent's status by the researcher that enabled the successful deployment of the EBDP. This facilitated the dialogues and developmental exchanges between the researcher and the owner manager using PAR that were important to successful adoption and ownership of e-business in this study.
- m) The final creative foundation dimension of the research methodology within this study is the utilisation of a base version of Personal Construct Theory (PCT). Key to effective completion of the PAR process within the more progressive case studies has been researcher ability to build outline understanding of owner manager 'starting points' of understanding and perspective of ICT and its potential for his business. The researcher developed a crude PCT based analytical frame of reference which facilitated learning and development dialogues with the owner manager from these starting points. This allowed for the nurturing on,

enhancing or shifting of this base understanding, based on this frame of reference.

- n) In its totality the methodology represents a creative and innovative action research approach to enhancing understanding of e-business uptake and usage within small businesses. As such the innovative research methodology which facilitates this research makes an original contribution to small business knowledge development processes. In turn, creates unique dimensions of understanding with regard to the small business ICT usage that it was designed to facilitate.

9.2.6. Conceptual Framework Contribution to Subject and Knowledge

Utilisation of an epistemological bootstrapping process in the early stages of the research facilitated the elaboration of a conceptual framework which provided foothold for the mainstream empirical component of the study.

Retrospective review and assessment of the research process in its entirety that the epistemological bootstrapping process and resultant conceptual framework facilitated, including the research outputs that the research process produced, directs one to suggest that the conceptual framework in its pivotal position and role does itself represent an original contribution to knowledge with regard to

(a) The unique combining and synthesis of partial frames of small business, ICT and strategic management knowledge which the author in his epistemological bootstrapping mode produced;

(b) The enhancement of small business/researcher interface which it accommodated – and quality of utility of findings which that enhanced research interface produced; and

(c) Integral to (a) and (b), the innovative action research methodology toward which the conceptual framework lent itself as partial facilitator.

There are indeed a number of 'future user' perspectives from which such an original contribution to knowledge claim finds support.

Firstly, the conceptual framework offers itself to subsequent small business ICT researchers who can pick up and utilize the framework in its totality, or with regard to one or more of its component parts, as key foundation input to their own research in this area. They may for instance see a potential in utilising the conceptual framework as one key input in their own epistemological bootstrapping when commencing their own research study.

From a second perspective, future researchers may see a potential in their own epistemological bootstrapping to use the conceptual framework as in perspective one above - and also to utilize the resultant insight and findings in this study in its totality in order to bring about progressive adjustments and enhancements to the original conceptual framework. Effectively, subjecting the original conceptual framework to further bootstrapping process wherein the understanding and findings of this research study provide additional partial frames of insight to modify the original framework produced and applied by the author.

From a third perspective, which effectively, draws in part upon suggestions in perspective two, the conceptual framework could now, at the end of this study, be 're-diagrammed' to incorporate, at its base, the action research methodology which was successfully used in this research. In other words, the original conceptual framework facilitated design and development of the PAR research methodology - and now that the innovative nature and creative potential of that methodology have been proved through the remainder of this research, a newly couched conceptual framework capable of use by future researchers could actually include a guiding action research methodology component (effectively this would involve incorporation at the base of the conceptual framework the diagrammatic representation of the PAR research process which successfully drove this study).

And finally, from a fourth perspective, there is potential to claim original contribution to knowledge for small business ICT provider practitioners – whereby a re-diagrammed conceptual framework could include a base guiding research methodology component which is derived from adjustments to the original conceptual framework by utilising key practical insights produced by this study, not least the nature, form and pivotal role of the ‘trusted agent’ provider interface in effecting successful ‘owner manager-ICT supplier’ interface. Thus, in short, this perspective conceptual framework would contribute to knowledge in this guiding form, for practitioners, with a base ‘practice/practitioner’ guiding methodology component (in contrast to the above perspective two research methodology which more accurately mirrors the academic action research of this PhD study).

That such a ‘four perspectives’ claim of original contribution to knowledge has validity can be found in the subsequent post research completion development actions of the author who, having commenced this study as a non-academic ICT practitioner, is now continuing his personal career from the duality of small business ICT support provider and academic ICT educator within the university system. And who, within this dual role, is currently in the process of utilising and enhancing the original elaborated conceptual framework by re-visiting and ‘re-diagramming’ the framework in the light of close consideration of findings produced at the various stages of the research and the associated research actions and processes that ‘really worked well’ at those various stages. That is to say, the author is now utilising the conceptual framework which formed the base of his research through subjecting it to adjustments and enhancements, in the light of this study, to guide his future work both as academic ICT educator/researcher and small business ICT support practitioner in just the ways suggested as offering utility for others in the worlds of academia and practice within the perspectives outlined above.

9.3. Potential avenues for further research and investigation

9.3.1. Internet States and the use of the EBDP

This work studied and examined small firms in relation to adoption of e-business from Internet State 2 (access) to Internet State 4 (integrate internally). The evolution of e-business in Case Study 3 from Internet State 3 to 4 was undertaken by a commercial ICT provider. An examination of the evolution of e-business to Internet State 4 using the EBDP may provide a rationale for future work.

No firm in the study evolved to Internet State 5 or 6. Future work could examine a small firm engaging in Internet States 5 and 6 levels of e-business utilising the EBDP.

9.3.2. Hubs and networks

No hub development was completed successfully in the study. It is not therefore possible to determine fully the relationship strategies needed by the small firm or the e-business provider. Focus upon small business hub development and the enabling potential of e-business applications in effecting successful hub development offers itself as an area of future research.

9.3.3. Small business strategic management and strategy development

This study has provided base informing insight into small business strategic management and strategy development and how ICT makes contribution in this respect. Within this work the case study investigations provided sufficient depth of insight to enable the challenging of orthodox modelling of strategic management as being rational long term planning in form and to recognise more of a 'learning ones way along' dimension to what owner managers do in practice. But the underlying aim of this study has never been to focus solely on small business strategy formation. Time, finance and support resources together with the predominant ICT orientation of this research restricted such a strategic management focus. The study does therefore point up the potential for future research which orients more specifically toward addressing the void in the existing literature with regard to understanding

small business strategy development processes. And for parallel research which builds further onto understanding unfolded in this study with regard to how ICT can be designed, developed and implemented to better facilitate small business strategic learning, strategic thinking and strategic management processes.

9.3.4. More rigorous use of PCT as key dimension of the methodology

The use of Personal Construct Theory in this study has been built on crude ‘educated layman’ adoption of the base premises of the theory. This said, the value of utilising PCT as a base instrument to build understanding of owner manager perspectives and understanding of ICT and its potential for his business has proved to be a significant facilitating research tool within this study. Potential thus exists for further research which proceeds to refine the overall methodology by developing more sophisticated research instruments using the parameters of PCT.

9.3.5. Suggestions for enhancing focus and approach regarding future investigation

This work relied heavily on the individual efforts of the researcher engaging with the owner managers and having the required ICT skills to deploy the services needed. Whilst this was successful in this study it highlights a potential hurdle for adoption for other researchers. They may not have all the required skills to deploy the EBDP as an individual. Future work could separate the ICT skills and the PAR elements needed to facilitate the EBDP. To do this it may be beneficial to have additional skilled ICT staff within the provision of the EBDP. They do not necessarily need to be directly involved in the research. In separating the skills needed to deploy the EBDP, the researcher who engages directly with the owner manager only needs to have the knowledge of what the ICT is capable of delivering at various Internet states. This could allow them to concentrate more fully on PAR with the firm’s owner manager. This separation of the skills needed to deploy an EBDP widens its use and makes it possible for a non ICT researcher to utilize the EBDP.

9.4. The practical implications of the work

The work has shown that the use of an EBDP can enhance e-business provision in small firms. Adoption of e-business is seen as a major enabler to keep businesses competitive, and this will impact upon the economy as a whole.

Integral to the distinctive developmental features and characteristics of the small business is the potential to build on the trusted agent concept. The trusted agent's relationship that exists in the case studies is housed within PAR as part of the EBDP. This facilitates a long term relationship between the ICT provider and the firm. The provider being able to understand the strategic learning and strategy development processes of the recipient small firms, and how the role of key informant inputs within the firm enables a richer and deeper understanding of owner manager existing personal constructs.

An understanding of how these have to be progressively adjusted or re-created in the light of new unfolding change situations is important. This holistic approach and the long term development of the integral relationships can better facilitate effective ongoing strategic learning and development activities and processes within the firm.

Such an understanding of the distinctive developmental features of the small business can direct the ICT provider toward a more flexible small business-specific approach to implementation of appropriate ICT provision within the small firm. This, in turn, will allow for the minimising of owner manager concerns with regard to e-business adoption, not least through the build up of a long term relationship.

9.5. Overall conclusions regarding contribution of the study to knowledge and understanding

This doctoral study concludes with summary of significant contribution it has made to existing understanding in the parallel areas upon which it focused: small business development and the impact of e-business on that small business development.

The origins of knowledge contribution sit both within the research outputs and findings of the study and the innovative research process which unfolded those outputs.

With regard to *research process*, the study is founded upon the development of a new and creative research methodology based upon ‘partnership working’ between the participant case study owner manager and the PAR researcher/ICT provider which involves them in integrated experienced-based learning and small business development practice.

Integral to the methodology is an integration of unique research dimensions and tools: (a) a central PAR-based action component; (b) fed by a base epistemological bootstrapping process to provide rigorous epistemology foundations; and (c) enveloping customised research instruments to facilitate small business e-business implementation and development – including: an EBDP and owner manager and a PAR researcher learning and development facilitating tool in the form of a PCT based analytical frame.

The whole is embedded within a qualitative case study mode of academic investigation, assessment and recording. This is underpinned by descriptive analysis to capture how understanding is embedded within and unfolds out of the small business development context in its totality.

With regard to the *research findings and outputs* which this creative methodology produced, the study has enhanced understanding of key enabling and constraining dimensions which either facilitate or hold back effective small business uptake of e-business applications. This includes personal constructs embedded constraints which impact on owner manager perspective and understanding of e-business potential for his business.

The study highlights how focus on owner manager learning process and integral fostering of owner manager understanding and learning with regard to ICT, as opposed to a mere commercial ‘here is an e-business application for your business’ ICT provider approach, is likely to lay the foundations for progressive effective, business development serving uptake of e-business within the small firm’

In terms of ICT provider development input, the study raises the potentially constraining issue of limited ‘selective focusing’ on the part of the ICT provider with regard to what is appropriate and relevant e-business application for the small business. That is to say, it is not merely limited perspective of the owner manager

which can constrain. In turn, this raises the issue of the need for mutual owner manager/ICT provider empathising with each others perspectives and starting points of understanding (and also highlights the potential use of PCT in this respect).

With regard to e-business applications and impact on small business development, the study enhances understanding of e-business contribution to small firm interaction with its external environment and of owner manager strategic learning and strategic thinking in his interface with his operating environment. This is bound together with the types of small business strategic development actions that result from such e-business facilitated strategic learning and interactions (these have included: improved market consolidation and market reach, increased market penetration and facilitation of company restructuring and relocation). Integral and often underpinning this are the kinds of improved working practices which the case study firms have adopted through implementation of e-business, but also of the ways that uptake of working practices can be constrained by non-holistic 'big picture' organizational thinking on behalf of the owner manager and/or the ICT provider.

The above provides indicative summary insight of the various strands of knowledge contribution which derives from this research and gives emphasis to how both the enhanced understanding that the research methodology produced and the innovative methodology itself offer new planks of knowledge which will themselves be progressively built forward and further adjusted by the researcher in the future. For this researcher, the premises of Personal Construct Theory hold strong: knowledge is not an absolute to be nailed down in its present form for ever; we as individuals can only approximate the reality of the world we live in. We progress by being willing and able to undergo a process of approximation and successive approximation of the 'worldviews' we hold in our personal constructs. So it is with the knowledge developed within this study.

10. Appendix 1

10.1. References

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